The New England
Journal of Medicine

Copyright, 1949, by the Massachusetts Medical Society

Volume 240 MAY 26, 1949 Number 21

THE SHATTUCK LECTURE*

La Médecine du Coeur

PAUL D. WHITE, M.D.†

BOSTON

IN 1806 there was published at Lyon in France by Mark Anthony Petit an essay entitled "La Médecine du Coeur," literally translated medicine of the heart but actually signifying not cardiology but medicine *from* the heart — that is, benevolence in the practice of medicine. It was composed of four parts written as poetry and presented as such before the Academy of Lyon, the first in 1800 on the difficulties and disappointments connected with the profession of medicine, the second in 1801 on trust in the physician, the third in 1802 on gratitude toward physicians, and the fourth in 1805 on pain. Petit was surgeon-in-chief of the Hôtel Dieu in Lyon, professor in the university and member of the Academy there and of the society of professors of the medical schools of Paris, Brussels, Antwerp, Bordeaux, Nimes, Marseille, Avignon, Grenoble and of Montpellier, where he had himself studied medicine. Nearly one hundred and fifty years have elapsed since these notable writings, but their truth and appeal endure and I have selected them as a text for the Shattuck Lecture of which I am sure Dr. Shattuck would have approved. It is of interest that George Cheyne Shattuck was himself a student at Dartmouth Medical School during the early years of the nineteenth century at the very time that Petit was delivering his essays. In fact, Shattuck received his M.B. at Dartmouth in 1806. He was president of the Massachusetts Medical Society from 1836 to 1840 and delivered the annual discourse in 1828. He established the Shattuck Professorship of Pathological Anatomy at Harvard Medical School in 1853. At the time of his death in 1854 his will established this lectureship, which was called by his name.

I shall discuss the subject of *médecine du coeur* from four viewpoints, which at first sight may seem quite unrelated but which actually are closely interwoven and together present the picture of the physician's position as a whole in the world of our day. All four subdivisions have been topics for addresses and lectures concerning the medical profession in the past, including Shattuck lectures themselves, but they have not, so far as I know, been correlated to give the complete picture. These four parts of the whole are in sequence: first, the individual doctor-patient relationship, secondly, the position of the physician in his community, thirdly, the national problem, and fourthly, the international or worldwide scope of medicine. Some would have it that in all these relationships a simple detached so-called "scientific" attitude should prevail, as from an "ivory tower," devoid of *médecine du coeur*, but those of us who have observed the actions of mankind during a generation are aware of the actual failure to apply science in such an attitude. So long as man is an emotional animal with a "heart," one must act truly scientifically — that is, with knowledge and wisdom — in recognizing that fact and in dealing with medical problems accordingly. I have long been impatient with the distinction so commonly raised separating the science from the art of medicine; they are both essential parts of one whole so far as the actual practice of medicine is concerned, embodying the know-how to deal with man himself as well as with his fellows of a lower order such as the bacteria that prey on him or help him. After all, science literally means knowledge based on accurate observation, and art is simply the skillful and scientific application of such knowledge; they are inseparable and should be taught as such.

It is so obvious to those of us who have been practicing medicine privately that our patients should be our friends that we do not often stop to ask the question, "Why?" The statement may seem trite to some, but to the beginner and to the skeptic it is well to pause a moment to present some of the answers. The first of all is in establishing more easily an accurate diagnosis. In my own field and in most other fields of medicine the diagnosis is in large part dependent on an adequate history

*Presented at the annual meeting of the Massachusetts Medical Society, Worcester, May 25, 1949.

†Clinical professor of medicine, Harvard Medical School; consultant in medicine, Massachusetts General Hospital; executive director, National Advisory Heart Council.

of the present illness, past troubles, family history, and social and business relationships. The sooner one establishes a sympathetic and friendly relationship with one's patient the sooner will one obtain the necessary information from all the story that can be told; any minor portion of the patient's account, sometimes in the form of a confession, may be vastly more important than all the laboratory tests in the world and may save not only time and money, but even misery and death themselves. A few years ago I gave an address to the McGill medical students entitled "The Patient Advises the Doctor," and to obtain such advice I asked some of my own private patients and also patients in the hospital wards to write to me what they thought would be worth telling young men and women who would soon be doctors themselves. I received many interesting and helpful replies, one of which was from Miss Mary Ellen Chase, professor of English literature at Smith College, whose essay inspired us to invite her to give the address at the annual banquet before this society a year ago. A letter to me from one of the ward patients at the Massachusetts General Hospital stated that she had so much friendship for her doctor that she would tell him even more than she would tell her priest. Such telling can contain invaluable information of strictly medical importance.

A second reason for establishing a friendship with one's patient is to ensure better treatment. Not infrequently necessary therapy is difficult, time consuming or expensive, and therefore likely to be neglected or postponed if impersonally prescribed by the physician. One might say "All very well, if the patient does not carry out the doctor's advice, whose fault is it? The patient's, of course." I deny that, except in rare instances in which one is dealing with persons of the lowest order of intelligence or who are mentally unsound, and even then the doctor should have recourse to some arrangement, public or private, which may more adequately deal with such persons than can the doctor himself with the limited time and resources at his disposal. In general, then, it is the doctor's fault if he cannot induce the patient or his family to carry out the necessary treatment; often the importance of establishing an initial friendship here becomes obvious.

The value of a clear and friendly explanation of one's diagnosis to the patient himself was well and forcefully stated by Petit more than a hundred years before it was appreciated by the medical profession in general; in fact, it is still frequently neglected even in these advanced and enlightened days. Petit wrote:

> When a patient asks us about the nature of his illness, we should not, like an oracle, reply in obscure terms and proclaim the ridiculous pretention of science in speaking only its language. The art of rendering oneself intelligible applies to all, and since it is one of the best means of persuasion, it should be one of the very first studies of the physician and medical student.

A third scientific reason for *la médecine du coeur* as it affects the private or individual patient is in the accretion of new knowledge. The co-operation of the patient in special investigations of symptoms, signs, mechanisms of disease that involve physiologic and biochemical procedures, prognosis, and therapy may be of inestimable value in the advance of medicine. Such co-operation is much more likely to come from a friend. For example, one of our recent studies has involved the follow-up records of 173 private patients of my own who consulted me over twenty years ago for neurocirculatory asthenia – all but 2 have been traced and one of these lost persons should be discovered before long, since she was a one-time volunteer in the Social Service Department of the Massachusetts General Hospital. Such a high percentage of success in follow-up study is less likely when one is dealing with case numbers and not with one's own friends. Also, postmortem examinations are still of much value in adding to our medical knowledge; the families of patients of ours who have also been our friends are much more likely than the families of "cases" to permit such autopsies if we but take the trouble to ask for them.

A fourth reason for establishing a good doctor-patient relationship is for teaching purposes. Some of the most important lessons that I have been able to present in my teaching to both undergraduates and graduates of medicine have been made possible because some of my most articulate patients, who have taken an active part in the teaching of my students individually, in small groups, or even in large amphitheater clinics, have been warm friends of mine.

And, finally, there is a great personal satisfaction and joy in the establishment of human friendships, not wholly definable, both for the doctor and, I am sure, for his patients. This human relationship is doubtless a potent reason for attracting many to the profession of medicine as to religious ministries. There is something here that we doctors prize and for which we should be grateful, something that is sacrificed by those who deal largely with inanimate nature, or even with growing things in the vegetable and animal kingdoms that lack the intelligence and soul of man himself.

With this introduction of the role played by *la médecine du coeur* in the doctor-patient relationship that makes up the vast majority of the functions of the physician in the world, let me go on now to the place of the doctor in his community. Actually he holds his honored place locally because he is medical adviser and friend of many of his neighbors and of other citizens of his community and their families. Often he is himself the leading citizen of his village or town, and I have prized among my own friends physicians, mostly family doc-

tors, whose help was sought not only to diagnose and to treat disease among their patients but also to decide about the daily problems of the community, whether they concerned the public health or the schools, the church or even the roads. My own father, a family physician, was such a person, a deacon in his church, a teacher and an active man in the good works of his environment, great compensations, to be sure, for his hard and exacting life. At one time when he was ill and I was a hospital intern off duty for a few days I made rounds for him and quickly discovered that strictly medical advice played only a partial role in what was expected of him.

Many doctors have served on boards of health, school boards, lay councils of the church, and even governing boards of institutions and civic bodies, but as a rule they are too busy and must burn the midnight oil even to do their ordinary doctoring. It is at considerable sacrifice that they can do more, and not a few physicians have fallen victim to the demands that have been made upon them. They have practiced a benevolence (*médecine du coeur*) far beyond their strength, and I would here and now put in a plea not only to the doctors themselves but also to their communities to help to spare them for longer and greater usefulness than has been the lot of the majority of the doctors in the past.

Since the days of Hippocrates it has apparently been the tradition in medicine for the doctor to overwork and to be himself a sacrifice. It is expected of him, somehow, whether he be general practitioner, specialist, teacher, administrator or research worker. It may quite possibly have been a noble tradition, but often it has been too noble and unreasonable. There are some signs of improvement in progress in this respect. For example, nowadays, it is common for the young doctor or indeed even for the medical student to marry and to begin to raise a family, doubtless fostered in part by World War II but also by a saner public opinion, which in my day frowned on such doings until we were well established medically after completing our hospital residencies. Perhaps likewise it will be possible more and more by the establishment of group practice and convenient substitutions to give doctors adequate vacations and time off at night so that they will not be constantly on the job. The communities as well as the doctors themselves should see that this is done and that the doctor be treated as a human being and not as a machine. The opposite evil of the establishment of an eight-hour day for all physicians is equally to be avoided. Medicine is not a trade so to be arranged, but there should be a happy mean between these two extremes.

And last but not least the doctor's family must be treated with more respect than customarily in the past. Too often wife and children are disappointed in their plans because of the exigencies of medical practice or research – some of this cannot be helped, but much of it can by better organization and by sharing of work, not in the form of socialized medicine with its threat to the all-important doctor-patient relationship but by simpler plans developed by the doctors themselves with the help of their respective communities.

There is another point of importance with respect to the doctor in his community, and that concerns his relationship with his medical colleagues. Great variations exist in such relationships from the friendliest co-operation to the bitterest hostility; fortunately the former situation holds most often. In Massachusetts we have been fortunate in inheriting and in maintaining a tradition of a friendly medical atmosphere. I would herewith pay tribute to the many physicians in Boston and throughout the State for their kindness and help to me, both personally, in my practice, and in my clinical research. My colleagues working in other hospitals in my field have invariably contributed data about cases, even from their private practice, to aid me in some study or other and have also given me their helpful advice and encouragement. Thus I would acknowledge my own debt and at the same time plead for more *médecine du coeur* from the doctor to his colleagues and from the community to its doctors.

The third phase of my subject deals with *médecine du coeur* for the nation. Here the public health is the main problem to be dealt with by both public and private enterprise. It is here too that I would plead for more understanding and co-operation between our Government administration on the one hand and the American Medical Association and its component parts in every state on the other. With a benevolent (*la médecine du coeur*) attitude to public-health problems of the nation, which is characteristic of each of these bodies, there should be no real conflict between them. Ample and friendly discussions should solve the difficulties that do exist. There is no need to enter into acrimonious dispute, which in the past has sometimes been based on personal prejudices and false pride.

It is obvious to us all that in the field of our own public health certain facts exist. In the first place, tremendous strides in medical knowledge by research have been made in this country during the past generation, more than in all the centuries of the past, and this has been in largest part under the stimulus, guidance and support of private enterprise in medical schools, hospitals and foundations throughout the nation. But it is now equally true that we are but at the beginning of our knowledge of the pathogenesis and mechanism of disease processes and of their adequate treatment and prevention. There remains much more still to be done than has been done in the past. Private resources, important though they still be, are inadequate for the job. Public aid, largely through

the new developments in the United States Public Health Service, can very wisely supplement the private resources for medical research. Not only is this necessary financially but the public wants and is now demanding a stake in medical research, and with increased interest and appreciation of the need and prospects for the future, they too wish to help. The greater number of trained research workers that can be put on the job with adequate facilities, the sooner we shall have answers to vital and important problems of public health such as cancer, or rheumatic fever, high blood pressure and coronary atherosclerosis, in which I happen to be personally interested and to help solve which the National Heart Institute was set up by an act of Congress last June. It was my conviction that public and private enterprise should join to fill this vital need, and that was why I enlisted part time in the work of the National Heart Institute and National Advisory Heart Council while continuing my private practice in cardiovascular disease. My experience to date, I might add, has been most encouraging — I have found my colleagues of the Public Health Service engaged in this work and my fellow private citizens on the Council most able, honorable, diligent and co-operative. *Médecine du coeur* has been constantly in evidence in all our deliberations and practice. I might add that it is these public officials themselves, medical and non-medical, who have constantly expressed and practiced a jealous protection for private enterprise and a liberal attitude toward private medical endeavor in research and teaching.

A second obvious fact that indicates the need of a liberal national support of medical endeavor in this country is the plight of the medical schools themselves. Both private and state schools require a large share of the resources of the universities throughout the country, so much so that the presidents themselves have been worried. Medical teaching is vital to the national health. Not only must we continue the high standards of the present day but also we must add appreciably to the output of new medical graduates. There are not enough doctors in the whole country as yet to meet all the demands. Since that is so I would plead for the admission to this country and for their distribution where most needed of several hundred able physicians still classed in Europe as displaced persons. Dr. Burgess, of Providence, has well spoken in their behalf and incidentally thereby in behalf of many thousands of citizens of our own country who need their help.

A third obvious fact is the lack that still exists in the United States, among many people, of adequate medical attention both for diagnosis and for treatment. The costs of medical care have risen so high that many of our citizens cannot afford them. Some are insured, but many are not. In some way or other, which must be decided by careful, conscientious and friendly discussion, such people must be protected and not left merely as a casual burden and charge for the medical profession or public purse, or both. The private practice of medicine should continue without interference, and the adequate care of the health of those unable themselves to pay for it should certainly necessitate neither the general socialization of medicine with its disadvantages as we see it elsewhere in the world today, nor the pauperization of our improvident people or of those unable financially to meet all the costs of medical care. This problem will take years still to solve. To my mind it is, however, less urgent than that of medical research, whose function it is eventually to make hospitals unnecessary.

Finally, we come to the most important of all the applications of *la médecine du coeur* — namely, the international. Fewer doctors are involved in this, but those that are realize its tremendous significance and power for good in these troubled times. It is a challenging but rewarding privilege to have a share in this work, which can be as potent a factor for peace as any in existence today. Without peace during the next generation all mankind will suffer, and attempts to advance in medical research, teaching and practice will be nullified. In fact if further and more devastating wars take place our civilization, including the present advanced state of medicine, can be set back a thousand years. With peace we can make great strides in the advancement of health for all the people of the world. Nothing else is so likely to maintain peace as the solicitous regard for the health and happiness of every inhabitant on this old planet of ours. We doctors are actually in a better position to accomplish this through the establishment of friendly and co-operative relations with the medical professions of other countries than are any other groups — in business, law, government or military circles. We have no ax to grind. We doctors are close to the hearts of all the world's citizens, and so by our own international medical friendships we surely can advance the peace of the world.

Medical congresses, visiting lecturers and medical traveling fellows can all play a role, but the most useful function of all, in my experience and in that of a good many others, as noted by neutral observers in many lands, has been played by the medical missions that have gone out to foreign lands, especially to those that have been ravaged by war, under the aegis of the Unitarian Service Committee. It is of these, as an example of what can be done, that I would like to speak briefly now, and for which I would ask your vigorous support.

Medical missionaries have traveled abroad for generations to do good, and they have done good, often but little known, but nevertheless of much significance in our international friendships, as in the case of my old acquaintance, Paul Harrison,

who has just completed thirty years of the ablest surgery and of setting a Christian example in Arabia. Relief missions have gone to every corner of the globe to succour people in need at times of epidemic disease, famine or disaster. I myself was privileged to spend a few months in Northern Greece in 1919 to help in the control of exanthematic typhus, a serious disease, which, like malaria, has now been largely wiped out in that part of the world.

The special teaching missions of which I speak are, however, something new and more important than other missions in the past. They have gone out during three consecutive years to establish or renew medical associations between the medical profession of our own country and those of other lands, many of which had been crushed down by the iron heel of the invader with abolition or reduction to a minimum of medical education, research and practice. We went throughout the countries in central and southern Europe to share our good luck and to repay a little of the debt that we doctors of the new world owe to the old.

I myself was privileged to serve on two of these missions, the first to Czechoslovakia in 1946 and the one to Greece and Italy in 1948. Other missions of similar nature went to Poland in 1946 and again more effectively in 1948, to Austria in 1947, to Finland and to Germany in 1948, to Colombia in South America in the fall of 1948, and most recently to the Philippines. Still another smaller group went to teach at the medical school for displaced persons in Bavaria last summer. New missions will be needed for other parts of the world, — for example, India, — but we must not forget to follow up especially those already carried out.

Each of these teaching missions has been composed of a group of professors, numbering from 6 to 16, from several different medical schools in this country and even from Canada or from countries abroad, presenting in lectures, demonstrations, and conferences (with the help of interpreters and student guides) various special fields in medicine, surgery, the preclinical subjects (such as physiology) and dentistry. Thus each group has acted as a peripatetic medical school carrying good will and friendship as well as medical knowledge throughout these foreign lands. The invitations came to us from the foreign universities themselves, but the purpose and success of the missions quickly appealed to UNRRA, to WHO, to the peoples themselves, and to the governments of the countries involved, and resulted in warm support and the most cordial reception everywhere. An excellent press publicity followed the course of each mission as it traveled through the countryside.

The enduring effects of such missions are still seen in Czechoslovakia, where, despite the Communistic regime and the serious hardships suffered therefrom, our friends, medical and nonmedical, made by the mission in 1946, have continued to be our friends as was clearly evident during my return visit there a year ago and by correspondence ever since. In the other countries too we have made and have held many friends. In these difficult days all this is bound to count in the long run. What we would have liked most of all to do would have been, and would still be, to re-establish a friendly medical contact with the USSR. We offered our services, but they were not accepted by the dictatorial group in power at the moment; I am sure that the doctors and the Russian people themselves would have welcomed us from their hearts and will do so one day. Meanwhile at the present time all indications seem to point to the political control of science in general and of medicine in particular in the USSR, resembling a good deal the Nazification of German medicine under Hitler, which not only blocked advances in medicine in Germany but actually resulted in a deterioration.

We hope that we may have the chance to share our medical experiences with our colleagues on the other side of the iron curtain when that curtain eventually is swept aside. This could be the beginning of a real friendship throughout the world. Meanwhile we should, with everlasting patience, constantly demonstrate to all parts of the world with which we can get in touch by personal contact, or by writing or radio, including the peoples immediately adjacent to the USSR as well as whatever inhabitants or citizens of the USSR we can reach, that we desire not to impose, but simply to share with all the world our way of life. It is very clear to those of us who have been privileged to make adequate comparisons that this way of life of ours, imperfect as it yet is, has advanced to a higher level than any other, standing as it does for freedom and happiness of all humanity, a precious heritage that we must forever defend from ruthless aggression. I personally believe that we should do more than pay lip service to this idea. We should by our own example and effort become active crusaders. In this small world today we are our brothers' keepers.

Let me emphasize once more the fact that these particular medical missions of ours were not simply "cold-blooded scientific groups." We did, of course, dispense and exchange by word and deed much scientific knowledge, but we did much more than that. We were the bearers of *la médecine du coeur* from this fortunate land of ours to our less lucky colleagues overseas. I have spoken of this particular activity in medicine internationally because it is a good example of what can be done and because I am myself familiar with it. There are, of course, other ways for the medical profession to help out in world affairs.

And so, my friends and colleagues, members and future members of the Massachusetts Medical Society, what a privilege and challenge is ours in the practice of *la médecine du coeur* for our patients,

toward each other, to our communities, for the national public health, and last but not least in our international relationships for the peace and happiness of all mankind!

In closing, let me quote again from our friend Petit:

Voilà, mon cher Forlis, ce qu'il fallait te dire,
Pour guider, en ami, cette ardeur qui t'inspire.
Loin de te détourner par d'effrayans tableaux,
J'ai même en les peignant retenu mes pinceaux;
Mais, sans t'epouvanter d'un récit trop fidelle,
Suis courageusement le penchant qui t'appelle:
Au bonheur des humains consacre ton repos.
Et que l'art de guérir compte aussi ses héros.

And that, my dear Forlis, is what I had to tell thee,
In order to direct, as a friend, the ardor which inspires thee:
Far from turning thee away by frightening tableaux,
I have, in painting them, restrained my brushes:
But, without the distraction of too exact a recital,
Follow courageously the leaning that calls thee:
To human happiness consecrate thy repose,
And let the healing art also count its heroes.

TREATMENT AND PROPHYLAXIS OF PULMONARY EMBOLISM BY VEIN INTERRUPTION*

COMMANDER MARION LEE CONNERLEY (MC), U.S.N.,† AND
CAPTAIN JOHN H. L. HEINTZELMAN (MC), U.S.N.‡

CHELSEA, MASSACHUSETTS

FOR the years 1944 and 1945, an average of 1 to 3 patients died each month at the United States Naval Hospital, Chelsea, Massachusetts, as a result of pulmonary embolism. The diagnosis in 17 of these patients was substantiated by autopsy. It therefore became apparent that some form of treatment must be instituted in an attempt to reduce the toll claimed by this scourge of surgical procedure in New England. In an effort to obtain some useful data that might be a contribution to this problem in general, a regime consisting of interruption of femoral, iliac or inferior-vena-cava venous pathways was adopted. A consistent, single form of treatment seemed more logical, if one desired to obtain data, than the treatment of some patients with heparin, some patients with dicumarol and some by ligation, or a mixture of the three. This report analyzes thirty-six months' experience with these surgical approaches to the treatment and prophylaxis of pulmonary embolism from December, 1945, to November, 1948.

DEFINITION

Thrombophlebitis (phlebothrombosis) is a pathologic process characterized by the occlusion of venous channels, partial or complete, static or progressive, by blood clot, portions of which are liable to fracture and dissemination through venous pathways to the lungs producing infarction of variable degree.

ETIOLOGY

Thrombophlebitis and phlebothrombosis are treated jointly in this discussion, since we now believe both procedures give rise to pulmonary embolism; should a patient succumb to a pulmonary embolism, it matters little whether his original blood clot was bland or inflammatory. It does make a difference in diagnosis, the bland type being much more difficult to detect.

Etiologically no explanation can be given as valid; there are perhaps four groups of conditions that are thought to be contributory:

Venous Pressure

In some diseases there is a definite lowering of venous blood pressure. In some positions there is a lowering of venous blood pressure. With less "urge" to maintain the velocity of venous blood through its channels, there may be some inducement to blood clotting, organization and thrombosis.

Infection

The inflammatory picture and the consequent syndrome of thrombophlebitis are too well known to require elaboration. It should be said, however, that infection, likewise, may give rise to thrombosis.

Mechanical Stagnation

If some of the impetus for blood to return to the right side of the heart is due to muscular activity, alternate contraction and relaxation and so-called "milking," aided by the action of vein valves, anything that may act to counter this influence may considerably affect thrombosis of the vessel. Intra-abdominal disease, cardiac decompensation, prolonged bed rest and so forth may contribute.

Abnormality of Prothrombin Metabolism

This process is little understood actually, and it is only suggested here that a constitutional

*The opinions or assertions contained herein are the private ones of the authors and are not to be construed as official and reflecting the views of the Navy Department or the naval service at large.

†Chief of surgery, United States Naval Hospital.

‡Chief of medicine, United States Naval Hospital.

factor may predispose to ante-mortem, intraluminal venous thrombosis under certain circumstances.

Symptoms

Symptoms are really few and given so little credence by the patient, and often by the doctor, that they are frequently overlooked. Except for the diagnostic symptomatology of pulmonary embolism familiar to all, there are actually only two pre-embolic symptoms: minimal cramps in the calf of the leg, and, if the patient is ambulatory, a slight limp.

That even these minimal pains may not be overlooked, patients are questioned daily on the presence of pain in the calf and pain upon walking. Often the patient remarks that there is some tenderness in the back of his leg upon moving his foot, but he is sure it is due either to the weather or to muscular rheumatism, which he has had before.

Physical Signs

Physical signs, fortunately, are more numerous. Early in our experience we reviewed our patients and our theories with Dr. John Homans, the pioneer in this particular field. He was of the opinion that most of the physical signs we stressed occurred in the relatively late stages of thrombophlebitis and rarely, if ever, in phlebothrombosis. However, owing either to the age group of patients with which we deal or to the fact that patients are carefully and routinely examined with definite signs in mind, we have yet to see a patient with pulmonary embolism who did not exhibit one or more of the following physical signs before the incident. Each patient in bed must be inspected carefully for the presence of these signs each day; often the slight calf-compression discomfort is fleeting, and in the next day the patient may be the victim of embolism.

Changes of Skin Temperature

These can be determined readily if the examiner places the palm of his hand upon the surface of the leg being examined. Often, the skin of the affected leg is cooler to the touch than that of the unaffected side. Gross temperature changes detected in this manner are usually accompanied by cyanosis or skin blanching; sometimes a definite sense of clamminess is discerned. More frequently, however, some objective form of skin-temperature determination must be made. We use the comparatively simple method of determining skin temperature with the McKesson thermocouple operating on a Wheatstone-bridge principle. These readings do not need to be corrected for room temperature and humidity, for all we seek is the relative temperatures of the two legs.

If the underlying process is inflammatory the temperatures will be elevated on the affected side over that of the opposite side. This, of course, may be attended by redness and other signs of inflammatory reaction.

We believe the common finding is decreased temperatures and think that it is caused by a concomitant spasm of the arterioles stimulated by the presence of a blood clot in the deep venous system. The close physical relation of the femoral vein and artery and the periphlebitis extending toward the arterial adventitia would provide adequate stimuli for such a sympathetic response.

Decreased Arterial Pulsations

Decrease in the strength of pulsation of the dorsalis pedis and posterior tibial arteries of the affected side is also a manifestation of an accompanying periarterial sympathetic stimulation.

Positive Homans's Sign

This should be more properly termed the dorsiflexion sign according to Dr. Homans, but it was he who called attention to its significance and we regard it as specific for thrombophlebitis and phlebothrombosis. Acute dorsiflexion of the foot will produce pain not only in the calf muscles of the affected side but also, in some cases, over the femoral canal. This is probably due to the tension placed on the diseased vein.

Calf Pain on Compression

Gentle to moderate compression of the calf of the affected leg is frequently most disturbing to the patient should a blood clot be present in the femoral system.

Swelling of the Affected Leg

Whether owing to associated lymph stasis, venous stasis or periarterial sympathetic action, the affected leg is increased in diameter when compared to the unaffected leg. The superior extent of the increase in diameter usually lags behind the level of the thrombus. When the calf is enlarged, we believe that the thrombus is at least in the common femoral vein and, when the thigh is enlarged, in the iliac vein. The diameter of each leg should be measured at exactly the same level, and our routine practice is to strike a level midway between the anterior superior iliac spine and the medial condyle of the femur in measuring the diameter of the thigh. The diameter of the calf is measured at a point midway between the level determined as above and the medial malleolus of the tibia.

Tenderness over the Course of the Vein

A vein harboring a comparatively active thrombotic process usually gives rise to some tenderness on pressure. Here again tenderness over the popliteal vein suggests thrombosis extending into the femoral vein, and, by the same token,

tenderness over the femoral vein at the groin suggests involvement of the iliac vein. In a relatively thin, co-operative patient one can occasionally elicit tenderness upon pressure over the iliac vein. This indicates involvement at least as high as the lower portion of the inferior vena cava. It must be remembered that the drastic palpation required to reach the region of the iliac vein will produce tenderness in a normal person; therefore, it is the comparative tenderness that becomes important.

Temperature, Pulse, Respiration and Blood-Pressure Elevation

Thrombophlebitis and phlebothrombosis, particularly as the process advances, will give rise to a slow, gradual elevation of temperature, pulse, respiration and blood pressure. Even in a patient who is doing well postoperatively, and in whom there is elevation in any or all of these factors, thrombophlebitis should be suspected, unless some other adequate etiologic agent can be definitely established for his reaction.

Treatment

Immediately upon the discovery of the presence of any one or more of the symptoms and signs of thrombophlebitis pointed out above, the chiefs of medicine and surgery are notified. These medical officers go over the patient again, and upon confirmation of the diagnosis, the patient is sent to the operating room without further ado.

The finite location of vein division depends upon the level at which the thrombus is assumed to be. If the thrombus is assumed to be in the popliteal vein or lower, bilateral common-femoral-vein interruption is performed. If the thrombus is assumed to be present in the common femoral vein on the right side, right-common-iliac and left-common-femoral interruptions follow. If the thrombus is assumed to be in the left femoral vein, owing to the technical difficulty of ligation of the left common iliac vein, an inferior-vena-cava ligation and division is performed.

After operation the patient is returned to the ward with his legs moderately elevated, usually only by means of the elevator of a Simmons bed, and with the pain controlled by sedation as necessary.

All patients whose femoral, iliac or inferior-vena-cava pathways are interrupted show some degree of swelling of the extremity after operation. To diminish the swelling and to prevent it from becoming chronic the following regime is used:

Before arising from his bed the patient is instructed to lie on his back and perform "bicycle" exercises for ten minutes.

With the legs still elevated, elastic bandages are applied, including the foot, from the ankle to the groin in figure-of-eight fashion.

The patient then gets out of bed and leans over the side of the bed in such a way that his hips are at the edge of the mattress and the body weight is supported by the abdomen, chest and arms.

In this position the patient "walks" for ten minutes without bearing weight.

The patient may then be ambulatory.

After whatever exercise or ambulation the patient elects, he returns to bed, elevates his legs and removes the elastic bandages.

This regime is maintained for two weeks every time the patient arises from bed.

Usually, no swelling is noted upon ambulation after this two-week period of graded exercise. Should any swelling develop, however, the entire procedure is repeated for a second session of two weeks.

Sequelae

During the period 1945 to 1948, vein interruptions have been performed in 67 cases. Of these, 51 were bilateral femoral-vein divisions, 6 were a combination of right-common-iliac and left-common-femoral divisions, and 10 were divisions of the inferior vena cava.

In all these patients some amount, either minimal or maximal, of lower-extremity swelling occurred postoperatively. The swelling was most severe after interruption of the common femoral vein. It was moderate after right-common-iliac and left-femoral procedures, and it was minimal after vena-cava operations. The edema was transitory, never over four weeks' duration, except in 2 patients, both of whom had superficial femoral-vein interruptions. One of these patients, who was about sixty years of age, had had persistent swelling of both lower legs for well over eight months. This persistent edema was relieved by lumbar sympathetic novocain block, by 0.3 gm. of etamon chloride solution intravenously administered. A bilateral lumbar sympathetic neurectomy was performed on this patient, with dramatic relief. It remains to be seen whether this is a permanent result. The other patient was an eighteen-year-old sailor who had an acute inflammatory thrombophlebitis following a basketball injury. After six months of unrelieved lower-extremity swelling following a superficial femoral-vein division, a bilateral lumbar sympathetic neurectomy was done. Complete remission of all swelling and disability resulted.

In our experience, which is limited not only in numbers but also in age group and which is further restricted by therapeutic ligation rather than prophylactic ligation, so far as the thrombophlebitic process is concerned, we have not seen the persistent chronic edema described by other clinics after

common-femoral-vein interruption above the saphenofemoral junction or after common-iliac and vena-cava interruptions.

The second sequela, which we have noted in all patients, was the cyclic recurrence of an acute thrombophlebitis picture in the portion of the venous system peripheral to the level of venous interruption. This was often severe enough to require considerable morphine and, again as suggested by Dr. Homans, it is to be expected in ligated veins that contain thrombi. These cycles of thrombophlebitis were usually limited to two or three episodes of three to five days each. In all cases they completely disappeared after three weeks.

In a patient whose collateral venous circulation is not yet completely established as a result of intravenous disease, a rather alarming amount of cyanosis of the extremity involved will be noted immediately after operation. However, just as the collateral venous pathways are established in thrombophlebitis, so are they established after interruption. In the course of twenty-four to forty-eight hours, the cyanosis will disappear, and the leg regain its normal preoperative color. We have noted this phenomenon in 2 patients: an elderly man with cardiac decompensation, who complained of severe cramping in his legs and constricting sensations of his chest; and a forty-year-old man, whose femoral veins were divided after celiotomy at which inoperable Hodgkin's disease of the adrenal glands, mesenteric lymph nodes and jejunum was found. In both cases at the end of forty-eight hours a discoloration was not apparent. Fractional spinal anesthesia of procaine solution to destroy only autonomic nervous activity is used as immediate treatment when this phenomenon occurs.

Results

Among these 67 cases 2 patients died.

The first was a twenty-one-year-old Marine who had had three previous pulmonary emboli following avulsion of his left arm by an airplane propeller. He had received two courses of heparin and one course of dicumarol. On the day the regime described above was instituted, he had a fourth pulmonary embolus. The inferior vena cava was operated on, and a solid thrombus was found extending above the right renal vein and so organized that it could not be detached from the vein wall. This patient died on the operating table. Autopsy revealed a solid thrombus completely occluding the left renal vein, extending up into the right side of the heart and, in addition, propagating into the superior vena cava.

The second patient was a fifty-year-old lieutenant colonel in the Marine Corps, on whom an orthopedic procedure had been performed ten days previously. He was seen immediately after a pulmonary embolism. In obvious distress, he was taken to the operating room immediately, and the right common iliac and left common femoral veins were interrupted. He did well after operation and was returned to the ward about 8 o'clock in the evening. Between that time and 6 o'clock the next morning he received four whole-blood transfusions of 500 cc. each, two plasma transfusions of 500 cc. each and two liters of physiologic saline solution intravenously. Although permission for autopsy was refused, it seemed apparent to all concerned that this man had died in severe pulmonary edema that was due to the uncontrolled administration of a large amount of fluid.

These cases must be considered as operative deaths and accredited to vein interruption. It is not believed that they, in any way, disprove the efficacy of this form of treatment and prophylaxis of pulmonary embolism.

Since January, 1946, there has been only 1 death from pulmonary embolism in the United States Naval Hospital, Chelsea, Massachusetts. This occurred in a sixty-five-year-old retired captain in the Navy, in whom the diagnosis of thrombophlebitis was made, but operation not performed.

The previous mortality in cases of pulmonary embolism was 0.5 per cent of all admissions. The average age was forty-one and six-tenths years, with a range of seventeen to eighty-four years. The vein-interruption rate, at present, is 0.5 per cent of all admissions. The average age is thirty-nine and two-tenths years, and the range eighteen to ninety-two years of age.

The coincidence is striking.

Technic

A considerable amount of literature is available describing the various methods of performing vein interruption. Briefly, the femoral-vein interruptions are performed under local anesthesia through a longitudinal incision above the level of the saphenofemoral junction. At least 2.5 cm. of vein is removed to prevent recanalization. The dictates of the Halsted school of surgery are followed rigidly, interrupted sutures and ligatures of No. 00 cotton being used.

The right common iliac vein is divided preferably under spinal anesthesia, but occasionally under pentothal and curare, or cyclopropane and curare, inhalation anesthesia. A right pararectus incision is used and carried down through the anterior rectus sheath. Sliding laterally to the right rectus muscle an extraperitoneal approach is made to expose the right common iliac vein. Should clot be encountered in the common iliac vein, conversion to the following operative field is quite feasible when this approach is used.

The inferior vena cava is approached through a similar type of skin incision, after which the right rectus muscle is retracted laterally and the peritoneum entered. The cecum is drawn laterally

and superiorly to the right, and an incision made into the posterior peritoneum medial to the right ureter. This incision is carried as high as necessary to demonstrate the right renal vein. A transperitoneal approach is used to the inferior vena cava, because we believe that such an exposure allows considerably more control of the situation should an untoward event occur. Any of the extraperitoneal approaches to this vital structure give adequate exposure for division, but little control should the distal stump of inferior vena cava slip away.

We do not believe in retrograde aspiration of a blood clot from a vein owing to the risk involved in removal of the clot intact. If the preoperative diagnosis of thrombus level is in error and an intraluminal blood clot in the common femoral vein demonstrated, the wound should be closed without disturbance of the vein, and an immediate attack made on the common iliac vein. Owing to the negative pressure in the inferior vena cava established by the heart beat and diaphragmatic action in respiration, we believe that placing the patient in Fowler's position actually affords little protection against the liability of an embolism.

Summary and Conclusions

Thrombophlebitis and phlebothrombosis can be treated by interruption of the common femoral vein, common iliac vein or inferior vena cava to provide prophylaxis against pulmonary embolism.

If careful, daily examination of patients after operation and those with cardiac disease is performed, signs and symptoms of thrombophlebitis and phlebothrombosis usually present themselves prior to pulmonary embolism.

Recurrent thrombophlebitis appears postoperatively but can be reduced to a minimum by graded exercises without postphlebitic syndromes in most patients.

The postphlebitic swelling syndrome may be effectively treated by bilateral lumbar sympathetic neurectomy, if further observations confirm the results of the 2 patients discussed above. These were the only patients in whom edema lasted over four weeks from the date of interruption.

Protection of the patient from pulmonary embolism by surgical interruption of selected veins can be accomplished with an insignificant mortality without the danger of massive delayed hemorrhage and the numerous critical laboratory observations required when anticoagulants are administered.

Bibliography

Allen, A. W., Linton, R. R., and Donaldson, G. A. Thrombosis and embolism: review of 202 patients treated by femoral vein interruption. *Ann. Surg.* **118**:728-740, 1943.

Idem. Venous thrombosis and pulmonary embolism: further experience with thrombectomy and femoral vein interruption. *J. A. M. A.* **128**:397-403, 1945.

Bauer, G. Heparin therapy in acute deep venous thrombosis. *J. A. M. A.* **131**:196-203, 1946.

Crafoord, C., and Jorpes, E. Heparin as prophylactic against thrombosis. *J. A. M. A.* **116**:2831-2835, 1941.

DeBakey, M., Schroeder, G. F., and Ochsner, A. Significance of phlebography in phlebothrombosis. *J. A. M. A.* **123**:738-744, 1943.

Frykholm, R. Pathogenesis and mechanical prophylaxis of venous thrombosis. *Surg., Gynec. & Obst.* **71**:307-312, 1940.

Homans, J. *Circulatory Diseases of the Extremities.* 330 pp. New York: MacMillan Co., 1939.

Idem. Pulmonary embolism due to quiet venous thromboses and simulating cardiac and pulmonary diseases. *New Eng. J. Med.* **229**: 309-314, 1943.

Idem. Deep quiet venous thrombosis in lower limb: preferred levels for interruption of veins; iliac section or ligation. *Surg., Gynec. & Obst.* **79**:70-82, 1944.

Idem. Diseases of veins. *New Eng. J. Med.* **235**:163-167 and 193-198, 1946.

Idem. Late results of femoral thrombophlebitis and their treatment. *New Eng. J. Med.* **235**:249-253, 1946.

Idem. Exploration and division of femoral and iliac veins in treatment of thrombophlebitis of leg. *New Eng. J. Med.* **224**:179-186, 1941.

Idem. Venous thrombosis and pulmonary embolism. *New Eng. J. Med.* **236**:196-201, 1947.

Ochsner, A., and DeBakey, M. Thrombophlebitis: role of vaso-spasm in production of clinical manifestations. *J. A. M. A.* **114**:117-124, 1940.

Idem. Therapeutic considerations of thrombophlebitis and phlebothrombosis. *New Eng. J. Med.* **225**:207-227, 1941.

Ochsner, A. Venous thrombosis. *J. A. M. A.* **132**:827-833, 1946.

Idem. Use of vasodilatation in treatment of venous thrombosis. *Surg., Gynec. & Obst.* **84**:659-664 (No. 4A), 1947.

SPLENIC-VEIN THROMBOSIS FOLLOWING TRANSTHORACIC GASTRECTOMY AND INCIDENTAL SPLENECTOMY*

STUART QUAN, M.D.,† AND BENJAMIN CASTLEMAN, M.D.‡

BOSTON

ALTHOUGH thrombosis of the splenic vein is infrequently reported in the literature,[1, 2] it is common knowledge among surgeons that this condition may follow splenectomy. In fact, local thrombosis at the site of ligation of the splenic artery and vein with extension back to the first branching vessel is to be expected. This degree of involvement of the splenic vein, however, should be symptomless, but it is potentially important because of possible extension into the portal venous system and as a source of emboli to the liver. Since splenectomy is usually performed for definite diseases of the spleen such as trauma, focal parasitic infection and tumors, or for diseases of the hematopoietic system favorably influenced by splenectomy such as hemolytic jaundice, thrombocytopenic purpura and Banti's syndrome, the risk of extensive splenic-vein thrombosis postoperatively has to be taken. With the introduction of the transthoracic approach to gastric surgery and the associated incidental splenectomy, the possibility of postoperative splenic-vein thrombosis assumes more importance.

Up to 1946 such normal spleens were removed in 70 cases at the Massachusetts General Hospital.

TABLE 1. *Lesions Resected with Which Incidental Splenectomies Were Performed.**

LESION	NO. OF CASES
Carcinoma of stomach (8 transabdominally)	48
Carcinoma of esophagus	11
Miscellaneous gastric lesions (3 transabdominally)	4
Miscellaneous abdominal lesions (transabdominally)	7
Total	70

*Unless otherwise stated, operations were through the transthoracic approach.

The majority of these spleens were removed incidental to transthoracic resections of a carcinoma close to the cardia, in either the upper stomach or the lower esophagus (Table 1).

The reasons for removing the spleen are presented in Table 2. Facilitating the operation by providing more adequate exposure for complete removal of the tumor was by far the most frequent reason. On other occasions the surgeon believed that it would be wise to remove the spleen so that it would not drag on the site of bowel anastomosis. The operator's note in 12 cases contained no specific statement why the spleen was also removed, but one may assume that it was also to facilitate the operation. Involvement of the spleen or pancreas by tumor represented another frequent cause for splenectomy. Thus, in 19 cases the tumor either was adherent to the capsule of the spleen or had actually invaded the splenic pedicle or hilus. An additional 6 cases showed tumor involvement of the tail of the pancreas as well as the spleen. Surgically induced trauma to the spleen, such as inadvertent injury to the organ's blood supply or persistent capsular oozing after prolonged retraction of the organ, accounted for 12 splenectomies.

TABLE 2. *Reasons for Splenectomy.*

REASON	NO. OF CASES
To facilitate operation	20
Not stated, but probably to facilitate operation	12
Operative trauma	13
Tumor adherent to spleen, splenic pedicle or splenic artery	19
Tumor adherent to or involving pancreas	6
Total	70

Eighteen patients died within forty-five days of operation, and all but 1 were submitted to post-mortem examination. As was to be expected, most of these cases showed local thrombosis of the splenic vein for short distances from the site of ligation. There were 5 cases, however, that showed thrombosis of the splenic vein and more extensive involvement of the portal system. Table 3 describes the extent of the thrombosis and the sequelae in each case. In 4 of these cases the thrombosis had extended into the portal vein and its intrahepatic branches to produce infarcts of the liver. Jaundice was present in Cases 1 and 3.

Case 1§ represents the only case in which the development and progression of the postoperative splenic-vein thrombosis turned out to be the main cause of death, and it was this case that stimulated the present study. It is presented in detail:

A forty-two-year-old yardman was operated on for the removal of an extensive scirrhous carcinoma of the stomach. In an attempt to remove all the disease, a total gastrectomy, transverse colectomy, splenectomy, esophagojejunostomy, jejunojejunostomy and complementary cecostomy were performed. The immediate postoperative course was uneventful except for a three-day spike of temperature to 102° F., and he was discharged on the 20th postoperative day. He did well for 1 week on a six-meal bland diet, with only occasional transient abdominal pains, but then, 26 days after

*From the Department of Pathology and Bacteriology, Massachusetts General Hospital.

†Formerly, intern in pathology, Massachusetts General Hospital.

‡Assistant professor of pathology, Harvard Medical School; pathologist, Massachusetts General Hospital.

§This case has already been published.[3]

the operation, he began to complain of increasingly severe lower abdominal pain, which spread to the upper abdomen and down the left side. Pain became almost unbearable after a light supper. He had not vomited and had felt only slightly nauseated. His bowels had moved daily, although on the day of and on the day previous to this admission his stools had been hard and small in amount. Physical examination revealed a slightly distended abdomen, with generalized voluntary spasm throughout, maximal in the left upper quadrant. No masses were made out. Peristalsis was active and normal in pitch when first heard. Two hours later it was diminished to absent. A small amount of feces in the rectal ampulla was found to be guaiac negative. An x-ray film of the abdomen showed only an air-filled loop of small bowel in the left upper quadrant that was somewhat dilated and had a fluid level on standing. The white-cell count was 12,500. A Miller-Abbott tube was passed. Exploratory laparotomy under spinal anesthesia showed a moderate amount of dusky fluid and many white carcinomatous nodules in the small-bowel mesentery. There were no dilated loops of bowel, no evidence of obstruction and no leakage around the anastomoses. Postoperatively the temperature ranged between 99.6 and 100.5°F. The abdominal distention increased. There was no audible peristalsis. The patient complained of pain in the testes and penis. There was considerable vomiting and occasional hiccoughs. On the 3rd postoperative day jaundice developed. On the evening of the 5th postoperative day he suddenly went into shock, with profuse sweating and dyspnea. The blood pressure was unobtainable. The abdomen was quite distended, and peristalsis could not be heard. He died 10 hours later.

At post-mortem examination the peritoneal cavity contained about 1500 cc. of turbid, straw-colored fluid. Many pale-white carcinomatous seedings were present over the peritoneum and mesentery. Scars of the operative procedure described above were found, and their various lines of anastomoses were intact. Beginning at a point 100 cm. from the origin of the jejunum and extending for about 100 cm., the small intestine was dark red, purple, fibrin coated, markedly edematous and gangrenous. In the mesentery all the veins to this loop were filled with ante-mortem, dark reddish, gelatinous thrombi, which extended into the superior mesenteric vein. The entire portal vein, its ramifications in the liver and the entire splenic vein were filled with reddish-brown, firm, adherent thrombi much older than those seen in the superior mesenteric vein and its tributaries.

Microscopical examination of the portal and splenic veins demonstrated definite organization of the thrombi, whereas those in the mesenteric vein and its tributaries were quite recent. The liver showed central congestion, but no definite foci of infarction were seen. There was also a pulmonary infarct.

Discussion

Although only 1 patient (Case 1) had specific clinical signs and symptoms attributable to the thrombosis of the splenic and portal veins, which eventually spread to major branches of the superior mesenteric vein to cause gangrene of the small bowel and death, there were pathologic changes in the other cases that may have been contributing factors to the major postoperative complications — peritonitis and pulmonary embolism — to which these patients succumbed. For example, it is possible that if the patients with multiple hepatic infarcts had not succumbed to postoperative complications, symptoms referable to the liver might have developed.

It is generally agreed that true infarction of the liver — that is, actual necrosis — occurs primarily as a result of occlusion of the hepatic artery or its branches. For example, accidental ligation of an anomalous hepatic artery in the course of surgery in the gall-bladder region produces total infarction, whereas emboli to the intrahepatic arteries in subacute bacterial endocarditis or secondary thrombosis of the intrahepatic arteries involved with periarteritis nodosa are causes of multiple small infarcts.[4, 5]

Occlusion of the portal vein and its main branches does not result in a true hepatic infarct. It may

Table 3. *Complications of Splenic-Vein Thrombosis.*

Case No.	Hospital No.	Patient	Age	Sex	Anatomic Diagnosis of Surgical Specimen	Day of Death Post-operative	Extent of Thrombosis	Major Cause of Death
1	A-11149	V. R.	37-42	M	Scirrhous carcinoma of stomach with metastases to regional lymph nodes	33	Splenic, portal and superior mesenteric veins	Thrombosis of splenic, portal and superior mesenteric veins; gangrene of small bowel.
2	A-11610	M. K.	54	F	Epidermoid carcinoma of esophagus	17	Splenic vein completely occluded; portal vein incompletely occluded; multiple incomplete infarcts of liver, measuring up to 15 x 18 cm.	Pulmonary embolism, multiple
3	A-10203	G. W.	46	M	Adenocarcinoma of stomach, recurrent, in wall of lower esophagus	9	Splenic vein completely occluded; portal vein and intrahepatic branches plugged with multiple thrombi; multiple incomplete infarcts of liver, measuring up to 8 x 8 x 5 cm.	Peritonitis, acute, left upper quadrant; empyema, bilateral.
4	A-11197	E. V. R.	71	F	Scirrhous carcinoma of stomach	42	Splenic vein and artery entirely thrombosed; portal vein and intrahepatic branches contained numerous small, reddish-gray, firm thrombi.	Massive pulmonary embolism; empyema, left; peritonitis, acute generalized.
5	A-11702	W. S.	67	M	Carcinoma of stomach with metastases to lymph nodes and pancreas	7	Splenic vein for distance of 3 cm., infarct of liver.	Peritonitis; acute pancreatitis; pulmonary embolism and infarct; uremia.

produce marked congestion, atrophy and necrosis of the central parts of the lobule — a lesion that is often called "incomplete infarction" or "atrophic red infarct" [6, 7] (Fig. 1). When an interlobar branch of the portal vein is occluded, however, the systemic collateral circulation is usually insufficient to prevent a true infarct. Multiple incomplete infarcts were found in Cases 2, 3 and 5. That these infarcts are not necessarily produced by extension of the thrombi into the intrahepatic portal-vein radicles, but by emboli from the splenic-vein thrombosis was demonstrated in Case 5, in which there was no thrombus in the main portal vein.

Mention must be made of the 52 patients who survived and of the 1 who died postoperatively but was not examined at autopsy. Careful review of their postoperative course revealed little or no clinical evidence that a splenic-vein thrombosis was present. Twenty-six of these patients had temperatures of 100 to 104°F. up to fourteen days postoperatively. These elevations of temperature were not accompanied or explained by any clinical development, and after such an extensive operation, it would be foolhardy to attribute them to a splenic-vein thrombosis. In only 1 patient were there complaints of unexplained left-upper-quadrant pain, slight jaundice and a temperature of 102°F., all of which occurred on the fourth postoperative day and lasted several days. This clinical triad is probably attributable to splenic-vein or portal-vein thrombosis.

Summary and Conclusions

Seventy cases of splenectomies performed incidental to some other operation (predominantly transthoracic gastrectomies and esophagectomies for carcinoma) are reviewed.

Five of the 17 patients studied at autopsy showed extensive thrombosis of the splenic and portal veins, and in 1 with superior-mesenteric-vein thrombosis the death was directly attributable to the initial splenic-vein thrombosis. The others showed multiple incomplete infarcts of the liver, which, had death not occurred because of peritonitis or massive pulmonary embolism, might have produced symptoms of liver failure.

Of 52 patients who did not die postoperatively, only 1 had suggestive clinical evidence of an underlying splenic-vein thrombosis.

Although it is recognized that incidental splenectomy is often necessary in the course of gastrectomy and esophagectomy, the surgeon should be aware of the occasional complication of thrombosis of the splenic and portal veins and hepatic infarction.

Figure 1. *Photomicrograph, Showing Marked Central Necrosis of the Liver Lobules in an Area of Incomplete Infarction.*

References

1. Bryce, A. G. Splenectomy and thrombosis. *Lancet* **2**:1423-1425, 1932.
2. Davis, H. H., and Sharpe, J. C. Splenic vein thrombosis following splenectomy. *Surg., Gynec. & Obst.* **67**:678-682, 1938.
3. Case Records of the Massachusetts General Hospital (Case 30141). *New Eng. J. Med.* **230**:431-435, 1944.
4. Pass, I. J. Infarction of liver. *Am. J. Path.* **11**:503-526, 1935.
5. Morgan, D. R., Lieber, M. M., and Stewart, H. L. Hepatic infarction in myelogenous leukemia and periarteritis nodosa. *Am. J. M. Sc.* **192**:540-546, 1936.
6. Zimmerman, H. M. Infarcts of liver and mechanism of their production: report of case. *Arch. Path.* **10**:66-78, 1930.
7. McMichael, J. Oxygen supply of liver. *Quart. J. Exper. Physiol.* **27**: 73-87, 1937.

OBSTETRICS IN THE WINCHESTER HOSPITAL (1928–1947)

SANFORD H. MOSES, M.D.*

WINCHESTER, MASSACHUSETTS

IN 1938, a report on maternal mortality in the Winchester Hospital for the years 1928–1937 was published,[1] with the intention of demonstrating that good obstetrics could be practiced in a small hospital. This report covers the twenty-year period 1928–1947 and includes fetal-mortality statistics for the last ten years. It is believed that the publication of statistics from this hospital and discussion of the problems and results will be of value to those who practice in similar institutions. Most of the available statistics come either from large maternity hospitals or from city, state or national areas. The figures presented below show the results obtained in a small general hospital, which is where the bulk of obstetrics is done. Comparison between similar hospitals should lead to general all-round improvement.

For the last ten years, a yearly analysis of the obstetric work has been made and presented to the staff. For the last year, monthly section meetings have been held. Both these points have, I think, been helpful in improving the quality of the work.

TABLE 1. *Deliveries and Cesarean Sections, 1928–1947.*

YEAR	NO. OF DELIVERIES	CESAREAN SECTIONS
		%
1928	224	8.6
1929	212	8.5
1930	228	5.7
1931	212	5.2
1932	198	7.0
1933	216	6.4
1934	225	7.1
1935	256	4.3
1936	245	2.8
1937	262	3.4
1938	285	2.1
1939	315	2.5
1940	346	1.15
1941	412	3.88
1942	577	2.25
1943	686	1.89
1944	701	3.7
1945	706	2.26
1946	942	2.96
1947	1102	3.44

The number of deliveries has increased to a spectacular degree. The hospital has had to utilize every bit of available space and to encroach to a limited degree upon adjacent rooms. By this means the number of obstetric beds has been increased from 19 to 31; the Department of Obstetrics has still been maintained as an independent, isolated unit in the hospital. The doctors' room has been converted into a 3-bed labor room, giving 5 labor-room beds. In spite of the additional beds, it is only by getting patients out of bed early and sending them home early that it has been possible to deliver so many patients. The members of the staff have given perfect co-operation. When the hospital is overcrowded, the patients most able to do so are sent home. So far, all those really needing hospitalization have been kept as long as was really necessary. Table 1 gives the number of deliveries per year and the percentage of deliveries accomplished by cesarean section.

The indications for cesarean section have been reviewed prior to operation by the chief of service.

TABLE 2. *Maternal Mortality.*

YEAR	NO. OF DELIVERIES	MORTALITY
		%
1928–1932	1,074	0.558
1933–1937	1,206	0.24
1938–1942	1,935	0.155
1943–1947	4,137	0.072

The main indications have been repeat section, cephalopelvic disproportion, placenta previa, premature separation of the placenta, toxemia and fetal distress, with a scattering for obstructing tumors, abnormal presentations, previous pelvic repair operations and the like. This system has served to eliminate the cesarean section for convenience. No reasonable indication has been refused, and the plan has worked well. Since 1933 no deaths have followed cesarean section, and in that time 212 patients have been so delivered. However, it is still believed that cesarean section is much more dangerous to the mother than delivery from below.

TABLE 3. *Mortality Rates in Three Other Hospitals.*

HOSPITAL	YEAR	MATERNAL MORTALITY
		%
Wenatchee[2]	1944, 1945, 1946	0.2
Illinois[3]	1945	0.179
Boston Lying-in[4]	{1946 {1947	{0.15 {0.15

The maternal mortality, as reckoned by five-year periods, is presented in Table 2.

In the previous report[1] (1928–1937) 3 deaths, which were due to miscarriage, were included. These have now been deleted. The maternal mortality is figured on the basis of the number of de-

*Vice-chairman of staff, Winchester Hospital.

liveries, and abortions are considered separately. Comparable figures are given in Table 3.

From 1928 to 1937 there were 271 abortions, with 3 deaths — a death rate of 1.1 per cent. Two were due to sepsis, and 1 to ruptured aorta. From 1938 to 1947 there were 315 cases of abortion, with no deaths. These are not included in the above figures on maternal mortality.

The following are brief reports of the fatal cases during the last ten years.

CASE 1. Labor was induced in a 38-year-old para II. She was 12 days overdue and had had a superficial phlebitis. Labor was very rapid and severe. She had an easy, normal delivery. The baby was stillborn. Immediately after delivery the maternal pulse became very rapid, and soon imperceptible. Respirations were very rapid. The maternal heart could not be heard. Oxygen, caffein, coramine and epinephrine were given, to no avail, and respiration soon ceased. Permission for autopsy was refused. The presumptive diagnosis was pulmonary embolism. When Steiner and Lushbaugh[5] reported on amniotic embolism, the marked similarity with their proved cases led to the opinion that this death was really due to embolism with amniotic fluid. If labor had not been induced, or if it had been slowed down, this tragedy might have been avoided.

CASE 2. A 43-year-old para III was delivered of a 9 lb., 9 oz., baby by midforceps. After delivery the patient seemed in good condition. Over the course of several days vomiting and marked distention developed. Four days after delivery the temperature began to rise, and chest pain developed, and on the 5th day the patient died. Autopsy revealed a rupture of the lower uterine segment, peritonitis, bronchopneumonia and an embolus in the inferior vena cava. Diagnosis of the difficulty or recognition of the gravity of the patient's condition might have saved her life.

CASE 3. This 39-year-old para II, with essential hypertension, was 6½ months pregnant. She had had a severe toxemia with her first baby. She was being checked daily in an effort to attain viability. The blood pressure varied from 160/100 to 224/120. An occasional + test for albumin was found. At noon on May 30, the blood pressure was 210/120 and a voided specimen showed a + test for albumin. The fluid output was equal to the intake. There was no pain, headache, scotoma or edema. At midnight she told her husband that she felt fine. Two hours later she had severe epigastric pain, vomiting and difficulty in breathing. The blood pressure was 290/140, and the pulse 60. Despite treatment, the patient became steadily worse and died. Autopsy showed a massive cerebral hemorrhage and the typical findings of eclampsia. It developed afterward that, unknown to the patient, both her mother and her mother's mother had died of convulsions in childbirth, and several aunts were known to have hypertension. This patient could have been saved if pregnancy had been interrupted early. It was a calculated risk in which it was believed that there would be time to intervene if the patient was watched carefully. The development of eclampsia was too sudden to permit this. More attention should have been paid to the minor warnings, and knowledge of the family history would have helped.

CASE 4. A 37-year-old para III, 8 months pregnant, was admitted to the hospital with abdominal pain and bleeding. There was marked edema. The blood pressure was 130/100. The patient had a mild convulsion and became comatose; her color was ashy purple, and the respirations were stertorous. The uterus was boardlike. A stillborn baby delivered spontaneously. Rather profuse bleeding followed. Intravenous administration of 25 per cent glucose and plasma was started, but the patient died. The diagnosis was premature separation of the placenta and eclampsia, confirmed by autopsy. It seems that the only chance to save this patient had been lost before she entered the hospital.

CASE 5. A 41-year-old primipara entered the hospital in mild labor with a blood pressure of 150/90. Two days before, the blood pressure had been 130/90. There was no albumin in the urine. Delvinal, 0.28 gm., and 100 mg. of demerol were given at 5:30 p.m. Labor progressed normally. At 8:00 p.m. the patient complained of headache; at 8:30 she became semicomatose and died in less than 1 hour. Autopsy showed eclampsia to be the cause of death. There does not seem to have been any chance to prevent this death.

CASE 6. This patient was a 39-year-old para III who had a rapid, severe labor. Shortly before delivery she had a mild convulsion. The respiration became stertorous. After delivery the pulse was unobtainable, and respiration was labored and noisy. Oxygen was given constantly. Intravenous injections of glucose and plasma were given without benefit. The respirations gradually ceased, and the patient died. Autopsy revealed that death was due to embolism with amniotic fluid. Perhaps slowing of the labor would have prevented this death. This is another proved case of amniotic embolism added to the 12 reported by Watkins.[6]

TABLE 4. *Causes of Death in the Two Periods.*

PERIOD	CEREBRAL EMBOLISM	PULMONARY EMBOLISM	PLACENTA PREVIA	ECLAMPSIA	HEART DISEASE AND BRONCHO-PNEUMONIA	POST-OPERATIVE SEPSIS	MESENTERIC THROMBOSIS	RUPTURED UTERUS WITH SEPSIS	EMBOLISM WITH AMNIOTIC FLUID
	NO. OF CASES	NO. OF CASES	NO. OF CASES	NO. OF CASES	NO. OF CASES	NO. OF CASES	NO. OF CASES	NO. OF CASES	NO. OF CASES
1928–1937 ..	1	2	1	2	1	1	1	—	—
1938–1947 ..	—	—	—	3	—	—	—	1	2*

*1 proved, 1 presumptive.

It is perhaps not significant, but all these deaths occurred in older patients. A comparison of the causes of death for the two ten-year periods is presented in Table 4.

Eclampsia seems to be the major bugbear. In most cases the difficulty has been a failure to recognize and treat the disease in time. This is, in some cases, the fault of the physician, whereas in several the patient has been guilty of at least contributory negligence by failing to keep appointments or to seek medical advice until too late. It is not believed that any doctor has been negligent or culpable in the above cases. The results are good but can be better, and criticism is directed entirely to that end.

Morbidity rates have been figured yearly since 1939 in accordance with the standards of the American Committee for Maternal Welfare. The rate dropped from 7 per cent in 1939 to 4.6 per cent in 1940 and 3.4 per cent in 1941, and since then it has averaged about 2 per cent. Sulfonamides and penicillin must be awarded the credit for this reduction,

but it is considered a creditable showing. The principal causes of morbidity were retention of lochia, upper respiratory infection, urinary infection and mastitis.

Figures on fetal mortality are the other side of the picture and of equal importance in an evaluation of the quality of obstetric performance. Only the figures for the last ten years are available. All deaths before discharge from the hospital are reported, though some infants lived many weeks. Any baby that lived even for a short time and all stillborn infants over twenty weeks of menstrual age or over 14 inches in length were considered viable. Any baby weighing under 5 pounds was considered premature. One or two babies each year have been sent to an infants' hospital for special treatment, and some have died there. Inasmuch as these deaths occurred outside this hospital, they have not been included in this report though actually they should be charged against the mortality figures. If these cases are included there is an increase of about 1 or 2 per thousand in the figures. Two of these babies who died elsewhere had diarrhea of the newborn. In 1946 there were 7 sporadic cases, with these 2 deaths. That no real epidemic occurred is, I think, a tribute to the efficacy of the nursing technic. Table 5 presents the fetal-mortality record for the two five-year periods, along with comparable statistics from other hospitals for the same periods.

Standards of viability and prematurity vary in different clinics. Various inclusions and exclusions make it difficult to obtain comparable figures. The figures given by Potter and Dieckmann[7] for fetal mortality in the Chicago Lying-In Hospital (1941–1946) offer an interesting example of this difficulty. They report a total mortality of 2.5 per cent, with 1.25 per cent stillbirths and 1.24 per cent neonatal deaths. This includes, however, only the first ten days and excludes babies under 1000 gm. No figures are given for the number of deaths after ten days. If the babies weighing under 1000 gm. are included, as they are in this series, the total mortality is 3.2 per cent, again equally divided between stillbirths and neonatal deaths — 1.6 and 1.59 per cent respectively. These figures are almost identical with those in the Winchester Hospital series.

TABLE 5. *Comparative Figures on Fetal Mortality.*

INSTITUTION	TOTAL BIRTHS	GROSS DEATH RATE	STILLBIRTH RATE	NON-VIABLE STILLBIRTH RATE	VIABLE STILLBIRTH RATE	TOTAL NEONATAL MORTALITY	NEONATAL MORTALITY AMONG PREMATURE INFANTS	NEONATAL MORTALITY AMONG INFANTS WEIGHING OVER 5 LB.	PERCENTAGE OF PREMATURE INFANTS THAT DIED	PERCENTAGE OF ALL INFANTS WEIGHING UNDER 5 LB.	VIABLE STILLBIRTH RATE
Winchester Hospital											
1938–1942	1,948	35.4	18.0	3.0	15.0	17.4	12.3	5.1	35.8	3.4	—
1943–1947	4,170	32.6	15.3	4.8	10.5	17.26	9.83	7.43	25.1	3.8	—
1938–1947	6,118	33.5	16.2	4.25	11.93	17.3	10.6	6.7	28.2	3.7	—
Boston Lying-in Hospital[8]											
1938–1942	16,814	36.0	—	—	20.0	16.0	9.0	7.0	26.0	—	—
1943–1947	13,240	39.0	—	—	21.0	18.0	9.0	9.0	25.0	—	—
Wenatchee hospitals[9] .	—	32.8	—	—	11.2	21.6	11.0	10.0	—	—	—
Chicago Lying-in Hospital[7]											
1941–1946*	17,657	—	—	—	—	12.5	—	—	—	—	12.4
Illinois hospitals (1944)[6]											
All hospitals	125,534	—	—	—	—	20.9	—	—	—	—	20.0
Larger hospitals† ...	19,854	—	—	—	—	15.8	—	—	—	—	19.0

*Does not include statistics on infants weighing less than 1000 gm.
†Hospitals reporting 500 to 999 births.

The causes of fetal mortality have followed the usually reported pattern.[9-11] The percentages of death from various causes have been calculated and are shown in Table 6. They illustrate the relative importance of various causes of death in various situations. They do not total 100 per cent because rare causes were not included.

TABLE 6. *Causes of Fetal Death.*

CAUSE	PERCENTAGE OF ALL DEATHS	PERCENTAGE OF STILLBIRTHS	PERCENTAGE OF PREMATURE DEATHS	PERCENTAGE OF NEONATAL DEATHS
Prematurity alone	25.7	—	46.0	32.0
Prematurity in addition to other causes	56.0	45.0		65.0
Congenital malformations ..	16.3	20.8	10.0	12.0
Birth injuries	14.4	5.5	0.2	21.8
Erythroblastosis	3.7	2.8	1.0	4.6
Maternal causes:	25.0	25.0	34.8	24.0
Placenta previa, premature separation of the placenta, toxemia, premature rupture of membranes				
Pressure on umbilical cord .	3.1	7.0	0	0

These percentages are not to be taken too seriously. Autopsies were done in about 35 per cent of all fetal deaths and in 60 per cent of the neonatal deaths among full-term infants. The

smallest percentage of autopsies was in the premature babies. Undoubtedly, some of the cases classed as prematurity alone would have shown additional causes of death if autopsy had been done. Moreover, the number of cases is not sufficient to give much statistical validity. However, in view of the agreement with other series of fetal deaths, some comment is justified. The most striking thing is that prematurity occurring in 3 to 4 per cent of all cases was a cause in 56 per cent of all deaths and in 65 per cent of all neonatal deaths. In many cases the cause of the prematurity was unknown, but in about 35 per cent the situation was due to maternal conditions, such as maternal toxemia, premature rupture of the membranes, placenta previa and premature separation of the placenta, which were all about equally culpable. Better care of premature babies and the exertion of every effort to prevent premature delivery should offer the best chance of reducing the total mortality. Perhaps stilbestrol will be valuable here. Birth injuries occurred much more frequently in the full-term group, though more injuries in premature babies might have been revealed by more autopsies. Prevention of very rapid deliveries and improved obstetric judgment and skill offer hope of reducing this group. Deaths from erythroblastosis and congenital malformations should occur less often in future, owing to recent advances in knowledge. In general, however, hope of improvement lies not in any one group but in painstaking vigilance and constant alertness to the possibilities of saving one baby here and another there.

Evaluation of these results has been helpful, and it is hoped that publication of them will be interesting and helpful to others. Publication of similar studies from other hospitals, so that various methods and technics may be compared by their results in actual "grassroots" practice, should be very fruitful in raising the general level of obstetric care.

15 Dix Street

References

1. Moses, S. H. Maternal mortality in small hospital. *New Eng. J. Med.* **219**: 957-959. 1938.
2. Conner, C. E. Obstetrics in small general hospital. *Surg., Gynec. & Obst.* **86**:499-501, 1948.
3. Newberger, C. Obstetric activities in Illinois hospitals during 1945. *J. A. M. A.* **134**:518-522, 1947.
4. *Annual Report of the Boston Lying-in Hospital.* 45 pp. Burlington, Vermont: Champlain Printers, 1947.
5. Steiner, P. E., and Lushbaugh, C. C. Maternal pulmonary embolism by amniotic fluid as cause of obstetric shock and unexpected deaths in obstetrics. *J. A. M. A.* **117**:1245 and 1340, 1941.
6. Watkins, E. L. Sudden maternal death from amniotic fluid embolism. *Am. J. Obst. & Gynec.* **56**:994-996, 1948.
7. Potter, E. L., and Dieckmann, W. J. Fetal and infant mortality for Chicago Lying-In Hospital: 1941 to 1946. *Am. J. Obst. & Gynec.* **56**:593-597, 1948.
8. Newberger, C. Analysis of obstetric activities in hospitals of Cook County during 1944. *Am. J. Obst. & Gynec.* **51**:372-386, 1946.
9. Potter, E. L., and Adair, F. L. Clinical-pathological study of infant and fetal mortality for ten-year period at Chicago Lying-In Hospital. *Am. J. Obst. & Gynec.* **45**:1054-1065, 1943.
10. D'Esopo, D. A., and Marchetti, A. A. Causes of fetal and neonatal mortality. *Am. J. Obst. & Gynec.* **44**:1-22, 1942.
11. Labate, J. S. Study of causes of fetal and neonatal mortality on obstetric service of Bellevue Hospital. *Am. J. Obst. & Gynec.* **54**: 188-200, 1947.

MEDICAL PROGRESS

ABDOMINAL SURGERY

ARTHUR W. ALLEN, M.D.,* AND CLAUDE E. WELCH, M.D.†

BOSTON

A REVIEW of the literature for the past year resulted in the abstracting of over 200 articles on surgical conditions of the abdomen that were considered of value. Since space is limited, all references except those given below are omitted. It is obvious that our selection of the contributions regarded as most pertinent to progress will, in the minds of some, fall short of a complete survey. We have tried, however, to present a fair estimate of the past year's work on new and controversial subjects.

Surgery in the Aged

Cutler[1] reports the results obtained in a group of 204 aged patients operated upon for acute lesions. These were all inmates of a charitable institution maintained for the care of the indigent in a metropolitan district. The over-all mortality was 44 per cent. The chief cause of failure was postoperative pneumonia, which accounted for 34 per cent of the deaths. One is bound to wonder whether some of these fatal pulmonary complications were embolic in origin since the group includes thigh amputation, intestinal obstruction and acute infections of various abdominal organs, all of which are known to be followed by phlebothrombosis and pulmonary embolism in a high percentage of older patients. It must be borne in mind that institutions for the sole care of the indigent do not have the facilities for early diagnosis and adequate preoperative and postoperative care found in large general teaching hospitals.

A correlation to the above statement is afforded by an excellent presentation by C. Stuart Welch,[2] who gives the data on 609 operations performed on

*Consultant in surgery, Massachusetts General Hospital.

†Clinical associate in surgery, Harvard Medical School; associate visiting surgeon, Massachusetts General Hospital; consulting surgeon, Massachusetts Eye and Ear Infirmary.

542 patients in the Carney Hospital (Boston). In this group of patients of seventy years or older, there was a mortality of only 11.4 per cent. The author states that 5 per cent of the population of Massachusetts are over seventy years of age. It is pointed out that these persons tolerate abdominal surgery poorly, with a mortality of 22.5 per cent in his series. Furthermore, in biliary-tract lesions over half the patients had complicated problems, such as common-duct stones, acute cholecystitis and cancer of the gall bladder.

Talcum-Powder Granuloma

Thirty-seven cases of postoperative complications due to talcum-powder granuloma are reported by Eiseman, Seelig and Womack[3] from the Barnes Hospital (St. Louis). The range was from simple wound abscesses to fecal fistula and intestinal obstruction. The lesions are most frequently confused with tuberculosis. The chronicity of the disease is stressed, and it is compared with pulmonary silicosis. There is a full review of the literature on the subject and the methods used for making the diagnosis microscopically.

Swingle[4] cites a patient who was operated upon fifteen times for talcum-powder granuloma with, finally, a fatal outcome. Repeated attacks of intestinal obstruction were the reason for the large number of operations. He states that the highest number of operations in any case previously reported was five. The diagnosis was established by microscopical examination.

The importance of this lesion cannot be overstressed. It is almost certain that many operations for postoperative adhesions with obstruction have been done without any thought that talcum-powder granuloma is the underlying pathologic process. Safe and suitable glove powder can now be obtained. It is expensive at present, but serious consideration should be given to its general use. Surgeons still using talcum powder should be conscious of the danger. Sparing use of this substance on the hands and within the gloves, which must be carefully washed after they are put on, should help in reducing this hazard.

Hernia

Gross[5] has presented a new and simple method of treatment for large omphaloceles. The skin is undermined on either side and sutured over the large sac, which has been carefully left intact. The child is left with the large mass, which gradually recedes into the abdominal cavity during the first ten months of life. At this time it is easy to resect the collapsed sac and repair the abdominal wall in an anatomic manner. Three cases are cited, in all of which the patients recovered.

Harkins and Schug[6] report the follow-up results on 131 hernias repaired by the McVay technic (conjoined tendon sutured to Cooper's ligament). Three recurrences were found two or more years after operation. The authors have used the method on 367 hernias and point out its value because it is applicable to all types of inguinal hernia. The article is well illustrated.

There are certain defects due either to repeated operations or to trauma that are not easy to repair even with fascia lata. Koontz[7] gives a preliminary report on the use of tantalum-wire mesh in the closure of such defects. He made a further report before the Southern Surgical Association, White Sulphur Springs, West Virginia, December 7-9, 1948.[8] The material is well tolerated in the tissues and causes no foreign-body reaction. Although it apparently can be used next to the intestine (without immediate harm) if there is no peritoneal structure available, it is believed that a peritoneal protection should be obtained when possible. It is further stated that skin with attached subcutaneous tissue of considerable thickness is preferable to skin alone. The mesh is held in place by fine tantalum-wire sutures.

Throckmorton[9] reports the use of tantalum-wire mesh in 16 patients. He has observed no wound complications or other evidence that this material was not well tolerated by the host. There have been no recurrences in a follow-up study of three to twenty-six months.

Portal Hypertension

Blakemore[10] reviews the subject and reports 40 cases in which portacaval anastomosis was completed. There were 5 postoperative deaths. He divides the types of liver disease that may be benefited by this operation into five groups as follows: schistosomiasis, Banti's syndrome, cirrhosis of the liver, ascites and posthepatitis cirrhosis. The operation is indicated if there has been massive gastrointestinal hemorrhage from esophageal varices or if the varices can be demonstrated by x-ray examination.

Linton, Hardy and Volwiler[11] divide the patients suitable for portacaval shunts into three groups: intrahepatic portal-bed block due to portal cirrhosis or thrombosis of the hepatic veins; extrahepatic portal-bed block due to congenital or acquired obliteration of the portal vein; and a combination of the first two types. Of 7 patients with the intrahepatic type operated upon, only 2 survived. Deaths in this group were due to liver failure. In 8 patients with extrahepatic block, all survived operation, and only 1 has bled since the procedure was done. Linton prefers the splenorenal anastomosis with preservation of the kidney, through the thoracoabdominal approach.

Welch[12] reports a successful suture technic with the aid of the Thomas–Smith intestinal clamp in an anastomosis between the portal vein and vena cava.

Everson and Cole[13] have ligated the splenic artery in 3 poor-risk patients with portal hypertension. The immediate results were satisfactory. The au-

thors stress the need of careful preservation of the splenic vein in this procedure since the venous channels are thus left intact as anastomotic vessels.

A more radical attempt to eliminate the hazard of varices in Banti's syndrome is reported by Phemister and Humphreys.[14] Total gastrectomy was done in a case in which there were subsequently two episodes of bleeding. Transthoracic resection of the lower esophagus and stomach was carried out in another patient. In the discussion of this paper, Wangensteen[15] stressed the acid-peptic digestive factor in bleeding from esophageal varices. In dogs with a simultaneously produced portal hypertension, a 90 per cent resection of the stomach will not regularly prevent ulcer provoked by histamine in beeswax. Without portal hypertension a 75 per cent gastric resection with short-loop retrocolic anastomosis will prevent this type of ulcer. Wangensteen described 3 patients subjected to extensive gastric resection for esophageal varices in 1945, 2 of whom were alive and well two years later. Pemberton[16] advised early splenectomy in Banti's disease to prevent esophageal varices. Blalock[17] reported a successful outcome after splenorenal anastomosis.

The Pancreas

Waugh[18] presents the data from the Mayo Clinic on pancreatectomy up to January 1, 1947. Of 49 patients in this group, 6 had total pancreatectomy with a lower mortality than that in those who had partial pancreatectomy, owing he believes, to the leakage of the closed pancreatic stump in some of the earlier cases. The over-all mortality was 26 per cent. Of 11 patients operated upon for benign lesions there was a fatal outcome in 45 per cent, owing to the technical difficulties associated with inflammation. Thirty-eight patients had carcinoma, 21 per cent of whom failed to survive the operation. One-stage procedures carried a slightly lower mortality than the two-stage operations. The survival rate following pancreatoduodenectomy for carcinoma of the pancreas was discouraging, and the author questions whether or not a cholecystoenterostomy in these patients would not produce an over-all better outcome when the operative mortality for the radical procedure was taken into consideration. The survival period for carcinoma of the ampulla of Vater was more encouraging, as pointed out by several other observers.

The technic of pancreatoduodenal resection has been described by Cattell,[19] and a further appraisal of the procedure made by him more recently.[20] He believes that patients with long-standing jaundice have a better chance for survival by a two-stage procedure. Fifty-two pancreatoduodenal resections have been done at the Lahey Clinic since 1942, with 9 deaths (17.3 per cent). Five of these were for benign lesions. Cattell[21] believes that one can tell whether or not the obstruction is due to cancer by the simple expedient of finding a dilated pancreatic or common bile duct. In nonresectable cases he believes that worthwhile palliation can be obtained by anastomosis of the dilated pancreatic duct to the jejunum.

Bartlett[22] has reviewed the experience with pancreatic carcinoma at the Massachusetts General Hospital from 1941 to 1947. Seventy-eight patients were seen, and 83 per cent were operated upon. Thirty-two per cent of the entire group had a radical resection. The operative mortality was lower with the two-stage procedures. At the time of his report one patient was living five years and another eight months after operation. The average duration of life of the remainder was seven months.

Owens[23] calls attention to the danger of peptic ulceration following pancreatoduodenectomy if the hookup is such that the acid secretions of the stomach enter the jejunum proximal to the bile and pancreatic juices. He reports 3 cases with this complication. It is generally understood and practiced now that the bile duct and pancreatic duct be implanted into the jejunum proximal to the stomach segment.

Thompson[24] has recorded a patient living and well seven years after pancreatoduodenectomy for carcinoma of the ampulla of Vater.

The Gall Bladder and Bile Ducts

Sainburg and Garlock[25] report 75 cases of carcinoma of the gall bladder from the Mt. Sinai Hospital (New York City) between 1933 and 1946. Sixty-five patients were operated upon, and 64 of these were dead within thirty-five months. One patient was alive over thirteen years after operation. Abdominal pain in 77 per cent, jaundice in 38 per cent and a palpable mass in 64 per cent were the predominant symptoms and signs. Seven patients had unsuspected carcinoma revealed after cholecystectomy. Stones were found in all but 1 patient. Graham[26] pointed out that stones were found in only 8 per cent of metastatic carcinomas of the gall bladder. These studies further confirm our opinion that stones are a causative factor in carcinoma of the gall bladder. Fortunately, the percentage of cancer in all cases of gall-bladder disease is low. Therefore, this argument should not be used too freely in advising cholecystectomy for quiescent gallstones, since there are much better reasons for so doing. It should, however, be kept in mind.

Strictures of the common bile duct still occur too frequently. They represent such a serious complication that at times we have believed that the patients were unfortunate in surviving their original operation. It behooves every surgeon to consider the possibility of an anomaly of the vascular and ductal region. There cannot be too much caution used in the accurate visualization of all structures during cholecystectomy.

Lahey[27] has presented the experience in his clinic with stricture of the common bile duct. He stresses the importance of end-to-end anastomosis with preservation of the sphincter of Oddi. In many cases sufficient distal duct can be developed by mobilization of the duodenum and splitting of the head of the pancreas. A T tube is placed through a new longitudinal opening distal to the suture line and is left in situ for one year.

Cole et al.[28] agree that end-to-end suture of remaining segments of duct gives the highest percentage of good results. When the distal segment was fibrosed and useless, as it often is, their best results followed a Roux Y hookup. A recent development they have made consists in constructing a new duct segment from jejunal mucosa. This may have possibilities, particularly if the newly constructed duct can be supported from within for a long time.

Longmire and Sanford[29] have utilized a new method of restoring continuity between the bile ducts and the gastrointestinal tract in 3 patients. In cases in which there is only scar tissue in the hilus of the liver and no available duct structure left that can be found, their operation may be applicable. The edge of the left lobe of the liver is resected. A bile duct is isolated, and this is transplanted into a loop of jejunum, which is further used to provide a cover for the raw surface of the liver. An enteroenterostomy is made between the two limbs of the jejunum.

Wilson and Gillespie[30] have reported the successful outcome on a patient with completely destroyed common bile ducts by the Longmire and Sanford method. A modification using the Roux Y anastomosis was considered preferable to the original technic.

Grindlay[31] has made a significant contribution to this subject. Tubes of a certain type of polyethylene film are constructed to bridge defects in the common bile duct as well as other hollow viscera. Experimentally it appears that this substance is inert in the human tissues. Bile salts do not seem to adhere to the inner surface of these tubes, and it is believed that they may not become plugged as easily as vitallium or rubber. It is important to point out that the polyethylene film must be a certain variety, which will soon be available for surgical use. Many of the polyethylene films employed so extensively in industry have a chemical substance incorporated that will actually cause tissue reaction and scar formation. The shape and size of polyethylene tubes made for a specific purpose offer a great advantage. In 4 patients in whom we have used these tubes in our Roux Y procedure the results have so far been better than those by other methods. If the tube is 1 cm. in diameter and can be held in place for many months, there is an excellent chance that scar-tissue constriction will not recur. There are naturally some difficulties in keeping these tubes from leaving the hilus of the liver too soon. Loops of wire may be incorporated in the outer layers of the tube so that they may be held in place by nonabsorbable sutures.

Best[32] again calls attention to the benefits derived from the use of dehydrocholic acid in preventing the deposit of bile salts in tubes that have been used for bile-duct reconstruction. He uses his so-called "biliary flush" of decholin, magnesium sulfate, cream or olive oil, nitroglycerin and atropine in all his cholecystectomies and common-duct explorations as well. Although this is a very useful method in postoperative common-duct stricture, it is a nuisance to the patient and is expensive and hardly seems justifiable as a routine after adequate gall-bladder and common-duct surgery.

The Stomach

Hamilton[33] calls attention to the development of gastric ulcer after deep x-ray therapy of the abdomen. In a group of 256 patients receiving more than 5000 r in the upper abdominal region as a part of the treatment for metastatic cancer of the testis, epigastric distress in two or three months developed in half the cases. In 35 of these patients gastric ulcer developed in a previously normal stomach.

This is confirmed by Bowers and Brick,[34] who have observed 6 patients with post-radiation gastric ulcer requiring surgical intervention. Three of these were operated upon for perforation, and 3 for massive hemorrhage, with recovery in all cases.

Marshall and Welch[35] have reviewed the Lahey Clinic experience with gastric ulcer for the period between 1936 and 1945. One hundred and thirty-one, or 16.4 per cent of 800 patients, were treated surgically. In this group there were 26 malignant ulcers (19.8 per cent). From this evidence the authors believe a more radical attitude should be accepted regarding the treatment of gastric ulcer. The results following resection for benign gastric ulcer were satisfactory, and no recurrent or anastomotic ulcers occurred in their cases. The operative mortality was 2.85 per cent.

An excellent article on the incidence of gastric cancer has been presented by Pack and McNeer.[36] Since this is not a reportable disease, it is not possible to obtain accurate figures for the United States. This lesion accounted for over 26,000 deaths in 1940, in this country. The reported incidence throughout the world varies directly with the economic status, the educational and medical facilities and the life expectancy of the community or country. Deaths reach the highest level in the age group between sixty-five and seventy. A most striking rise in the death rate from gastric cancer was noted among the Negro race. It appears to be slightly less prevalent among the Jewish race than it is in the non-Jewish population in European cities.

Sweet[37] reviews 86 patients with carcinoma invading the cardia and lower esophagus observed

between 1939 and 1948. He stresses the importance of the transthoracic approach, the use of antibiotics, including both penicillin and streptomycin locally and parenterally, the use of oxygen postoperatively, continuous gastric suction during operation and drainage of the pleural cavity for forty-eight hours after operation. There were 16 patients who had nonfatal complications, and there was an over-all operative mortality of 11.6 per cent.

An improved method of cytologic examination of gastric secretions is presented by Ulfelder, Graham and Meigs.[38] After careful lavage of the stomach the patient is left with an inlying gastric-suction tube overnight. The next morning washings are obtained and centrifuged. Smears are then studied by the Papanicolaou technic. Forty-five out of 48 patients studied had satisfactory smears. The 3 failures were in patients with almost complete obstruction. In 12 of 14 patients with cancer the diagnosis was correctly made by this method. One patient with lymphoma of the stomach showed no abnormal cells in the stomach secretions.

MacDonald, Ingelfinger and Belding[39] studied the motor function, intestinal absorption, pancreatic function and blood picture in 3 patients surviving total gastrectomy for three, five and ten years respectively. Two patients developed a macrocytic, hyperchromic anemia. The third had been receiving prophylactic liver treatment and had a normal blood picture. The pancreatic function and intestinal absorption were not particularly abnormal. The authors collected from the literature other cases of long survival following total gastrectomy. Apparently, ten and a half years for malignant and twenty years for benign lesions represented the longest survivals reported at the time of their investigation.

The Duodenum

Friesen et al.[40] found gastroduodenal lesions or erosions, or both, complicating fractures of the long bones in 27 out of 1432 autopsies. Experimental work was carried out in animals, and it was observed that similar lesions could be produced by operative fractures, curettage of the bone marrow and intravenous injection of small amounts of fat. The fractures did not increase gastric secretions or acidity. The authors believe that the ulcerations were produced by fat emboli, which could be demonstrated microscopically in the mucosal and submucosal vessels of the stomach and duodenum. The emboli produced anemic areas in the mucosa, which became susceptible to the acid-peptic digestive activity of the normal gastric juice.

Meulengracht[41] presents his experience of fifteen years with the management of acute bleeding in gastric and duodenal ulcer. He stresses the importance of a full puree diet in all cases. Of 1031 patients treated 26 (2.5 per cent) died. Unfortunately, the patients are not subdivided into age groups and the severity of the hemorrhage. He believes that patients should not be operated upon during or just after a hemorrhage and that operation may be considered if the patient is over forty years old, has persistent or repeated bleeding and has a definite ulcer by x-ray examination and if a competent surgeon is available.

Jones[42] advocates early gastroscopy between the third and tenth days in hematemesis and melena when x-ray films fail to reveal the cause of bleeding. In 60 per cent of cases he found superficial acute ulcers. He states that persistence of pain associated with an ulcer that has bled is a serious omen, and that all his fatal cases came in this group. According to him it requires from 100 to 150 cc. of blood to produce a tarry stool, and that 2000 cc. of blood introduced into the upper gastrointestinal tract will produce bloody but never tarry stools. He recommends a semisolid puree diet similar to Meulengracht's. The mortality in Jones's series was 8 per cent.

Stewart et al.[43] have recommended immediate operation on all patients with massive hematemesis and melena when there is good evidence that ulcer of the stomach or duodenum exists. Of 54 patients observed, 33 were operated upon, and the remainder used as controls since they or their physicians refused to consider surgery. Fifteen per cent of those operated upon died, whereas 29 per cent of those refusing operation succumbed. These patients were not given x-ray examinations prior to operation, and 4 of the 33 proved to be bleeding from other causes than ulcer and all these patients survived the exploration. The stomach was emptied of the blood clot by gastrotomy, and a radical subtotal gastrectomy was done, even if no definite ulcer was found. In 5 of these cases shallow ulcers with bleeding vessels were demonstrated. An average of 3600 cc. of blood was used in the surgical group and 2040 cc. in patients not having operation.

Warren and Lanman[44] have presented their experience with massive hemorrhage from gastric and duodenal ulcer in the West Roxbury Veterans Administration Hospital. They advocate urgent operation in patients over forty-five years of age who continue to bleed massively for more than twenty-four hours, and in those who have bled massively and stopped bleeding but have shortly thereafter bled again. In patients with difficult duodenal ulcer, they have had good luck in a small number of resections with exclusion of the ulcer and with two-stage procedures.

Dunphy and Hoerr[45] discuss the problem of massively bleeding ulcers at the Peter Bent Brigham Hospital (Boston). They have limited their operations to patients who appeared to be actually bleeding to death. From 1940 to 1945 there were 117 patients with massive bleeding admitted, with a mortality of 7.6 per cent. In 1946 and 1947 there were 45 cases with 1 death. Of 6 patients operated

on in the first series 3 died, whereas in the last group 7 were operated upon, with no deaths.

Baker[46] made a clinical study of 576 patients admitted to the Selly Oak Hospital (Birmingham, England) in the six-year period 1940–1945, with bleeding from gastric and duodenal ulcer. In this series the mortality was 14 per cent, whereas in a similar group admitted from 1934 to 1939 it was 7 per cent. The effect of the war on the psychic and economic situation is offered as an explanation of this discrepancy. The author believes that x-ray examination should be withheld during the acute phase, since recurrence of bleeding that resulted fatally was noted in 6 patients shortly after fluoroscopy.

A comparative study has been made by Allen[47] on two series of patients with uncomplicated duodenal ulcer. One group was treated by the standard partial gastrectomy, and the other by vagus-nerve resection. The results are considered on the immediate and interim basis, since many of the cases, particularly in the vagus-resection group, have not been followed sufficiently long to be classified as end results. The good results in both groups were approximately the same: 85 per cent in the gastric resections and 87 per cent in the vagus resections. The operative mortality was 2 per cent in the former as opposed to 0 in the latter. A similar study has been carried out by Warren and Meadows[48] on a smaller group of patients with almost identical findings.

Moore[49] gives a detailed analysis of 84 patients subjected to vagus resection. A strict grading revealed 75 per cent good results, 18 per cent fair results and 7 per cent poor results. Actually, the surgeon and the patient were reasonably well satisfied in 90 per cent of the cases. Sixty-two per cent of patients had diarrhea, which was of major importance in 14 per cent. Sixty-seven per cent had some sensation of fullness, which was major or continuing in 13 per cent. Incisional pain was serious in 3 per cent, and subsequent gastroenterostomy was necessary in 2 patients. The highest percentage of satisfactory results was found in patients subjected to vagus-nerve resection for anastomotic ulcer.

Colp et al.[50] made a comparative study on two groups of patients with duodenal ulcer. In one group 38 patients were subjected to partial gastrectomy only, and another group of 34 had vagotomy in addition. The added vagus resection did not increase the operative mortality (no deaths in the group), but definitely increased the morbidity. A higher incidence of achlorhydria was noted after the combined procedure.

Walters and his associates[51] state that vagus-nerve section gave results that were inconstant, variable and in most cases unpredictable. The relief of pain after vagotomy was considered to be due to a release of gastric spasm and a reduction in gastric acidity. Since one incident of unsuspected perforation of a duodenal ulcer occurred after vagus-nerve section, the authors deduced that the freedom from pain was unrelated to the healing of the ulcer.

It appears that the majority of surgeons dealing with a large number of patients believe that vagus-nerve resection should be used for the treatment of stomal ulcer if none of the antrum had been left behind at the initial resection. Also, the procedure should be evaluated when operation for uncomplicated, intractable ulcer is considered in patients under thirty years of age. It is definitely contraindicated for gastric ulcer, because it is never possible to be certain that the ulcer is benign. It is generally believed that vagus resection and gastroenterostomy are illogical since, as Faxon[52] has suggested, gastrojejunal ulcers with gastrojejunocolic fistula might again become a common problem under such a regimen.

The clinical features and late results in 244 patients with gastrojejunal ulcer entering the Mayo Clinic between 1937 and 1948 are discussed by Priestly and Gibson.[53] The surgical mortality was 4 per cent. Subtotal gastrectomy with excision of the stomal ulcer gave satisfactory results in 87 per cent of the patients over a period of five to ten years. If a previous partial gastrectomy had been done the results with a higher resection were less satisfactory. The immediate results following vagotomy were good in 19 of 24 patients who had had previous partial gastrectomy and in 19 of 20 patients whose previous operation had been gastroenterostomy only.

The Small Intestine

Ravitch[54] suggests the implantation of the ileum into the anus after total colectomy for benign lesions such as polyposis and ulcerative colitis. In 2 patients so treated after colectomy for ulcerative colitis, there was good sphincter control, and excoriation of the skin was not a problem.

Endometriosis as a cause of small-bowel obstruction is discussed by McGuff et al.[55] Obstruction occurred in 16 of 48 cases of endometriosis of the bowel observed at the Mayo Clinic between 1920 and 1946. The patients varied in age from thirty-one to fifty-four years, with an average of thirty-nine and a half. Although 15 of the 16 patients were treated by bowel resection the authors believe that ovarian ablation, preferably by operation with proximal decompression of the bowel, will result in complete resorption of the obstructive process. Although their premise may be sound, one doubts the advisability of such an indirect attack for localized obstructive lesions since the morbidity is greatly increased. Furthermore, it is well known that scar tissue resulting from endometriosis may produce obstruction of the bowel after ovarian function has ceased.

Spackman[56] reports 5 additional cases of bowel obstruction following irradiation for pelvic carcinoma. He calls attention to the early hyperemia and edema of the ileum and sigmoid that are often seen, and believes that the late obstruction is due to resulting scar tissue.

The Colon and Rectum

Swenson and Bill[57] have deduced from the study of 20 children with congenital Hirschsprung's disease that this lesion is due to an area of localized spasm in the low sigmoid. Careful x-ray examination will reveal the area of spasm accurately. After an operative procedure had been developed in animals, thought best adapted to resection of the spastic area and preservation of the sphincter in such cases, 3 children were successfully operated upon. The follow-up period is short, but the method promises to revolutionize the management of this troublesome malady.

Kiefer[58] tried all the "specific" methods of medical treatment known to him in ulcerative colitis. Sulfaguanidine benefited the greatest number of patients, but penicillin and sulfasuxidine were of most value in the preoperative and postoperative periods and for control of abscesses or peritonitis. In 527 cases followed for two or more years the results were satisfactory in 46 per cent. Medical management was successful in two thirds of the milder cases and in a third of the severe forms of the disease. Ninety-nine of 400 patients under observation for a long period were eventually operated on.

Vagotomy has been performed by Dennis[59] on 28 patients with ulcerative colitis or regional enteritis. Response to this indirect attack was successful in a high percentage of the patients so treated. The method is more adaptable to patients whose disease has not already produced extensive fibrosis and lack of distensibility of the bowel wall. The mechanism of this effect is in doubt, but the reduction in mucosal vascular response to intense emotional disturbances and relief of enteric spasm seem to be relevant. Vascular response to strong emotion can be observed through the sigmoidoscope in these patients, and it appears that such responses are no longer present after vagus-nerve interruption.

Cattell and Sachs[60] report that 26 per cent of 630 patients under treatment at the Lahey Clinic for ulcerative colitis were operated on. Ileostomy was performed in 145 cases, partial colectomy in 46, and total colectomy in 75. The operative mortality was 18, 15 and 4 per cent respectively in these procedures, with a total patient mortality of 22.3 per cent. Patients recently operated upon show a reduction in operative mortality to 4 per cent. The authors believe that when surgical intervention is necessary in ulcerative colitis, ileostomy will be required, and in most cases this procedure must be followed by removal of the colon.

On the basis of a recent study of 71 consecutive cases of ulcerative colitis, Best[61] believes that approximately 90 per cent of these cases can be managed medically. In his opinion there is little evidence to support early ileostomy in the hope of arresting the disease so that restoration of continuity may eventually be carried out. Furthermore, he considers it better to have a few patients arrive too late for successful operation than to subject too many to permanent ileostomy.

Crohn, Garlock and Yarnis[62] state that 8 per cent of their patients with idiopathic ulcerative colitis have right-sided lesions. There is a tendency to spread to the left side of the colon, and even when the rectum and sigmoid appear to be normal, fistulas and abscesses in the perirectal area develop. The authors have apparently had greater success with subtotal colectomy and ileostomy, with final re-establishment of ileosigmoidostomy, than other observers.

McKittrick[63] has presented an excellent treatise on carcinoma of the colon. The historical background is given, as well as a modern set of basic principles regarding the problem, as follows: the proper preparation of the patient for operation; optimum exposure of the segment of bowel to be excised; adequate mobilization of the bowel; adequate operation for cancer; free blood supply of both segments to be anastomosed; avoidance of tension on the suture line; and proximal complete temporary colostomy if adequacy of suture line or blood supply is in doubt. The surgical mortality in 90 patients operated upon between 1932 and 1941 was 11 per cent in comparison to 3.6 per cent in 110 with primary anastomosis operated upon between 1942 and 1947.

Jones, Robinson and Meads[64] report 137 consecutive combined abdominoperineal resections for carcinoma of the rectum and lower sigmoid without mortality. They attribute their lack of fatal complications largely to the use of alloy steel wire in abdominal-wound closure. The usual amount of urinary retention and bladder infections was obtained. Mild obstruction relieved by passage of a Miller–Abbott tube occurred in 9 per cent. There were only 2 cases of pulmonary infarction, and 4 of atelectasis. Wound infection occurred in 2 per cent of the cases.

Dixon[65] presents the results obtained in 426 cases in which anterior resections of the rectosigmoid and upper rectum, with primary anastomosis, were performed. A routine defunctioning transverse colostomy is done, and drainage is established to the sacral area through the lower end of the abdominal wound. Since chemotherapy was made available the operative mortality has been reduced from 5.9 to 2.6 per cent. In 272 patients the five-year survival was 67.7 per cent.

Wangensteen and Toon[66] review the results of low anastomosis after anterior resection. They

found 7 local recurrences in 51 cases (14 per cent) and state that these were outside the anastomotic area. Their patients had no difficulty with sphincter control and had normal sexual function.

Preparation and aftercare of patients on whom operations on the lower bowel have been performed is discussed by Bacon and Rowe.[67] A clean, tranquil bowel is desired, and this state may take several days of preparation. Sulfathiazole and streptomycin are advocated for only forty-eight to seventy-two hours preoperatively, because it is believed that the early effect can be depended upon but that reversion of action frequently occurs. A recent series of 142 cases without mortality is reported.

The urge for sphincter preservation may be on the wane. The number of local recurrences has been too great in the hands of most surgeons. Implantation of cancer cells into the suture line must be considered as a possible cause for recurrence. One is justified in preserving the sphincter in patients who have liver metastases and in those with very early lesions that can be adequately removed by any local procedure. Judgment based on experience plays a greater role in this situation than in many others.

References

1. Cutler, C. W., Jr. Urgent surgery in aged. *Ann. Surg.* **126**:763-779, 1947.
2. Welch, C. S. Surgery in aged. *New Eng. J. Med.* **238**:821-832, 1948.
3. Eiseman, B., Seelig, M. G., and Womack, N. A. Talcum powder granuloma: frequent and serious postoperative complication. *Ann. Surg.* **126**:820-832, 1947.
4. Swingle, A. J. Morbidity and mortality in talc granuloma: report of fatal case. *Ann. Surg.* **128**:144-152, 1948.
5. Gross, R. E. New method for surgical treatment of large omphaloceles. *Surgery* **24**:277-292, 1948.
6. Harkins, H. N., and Schug, R. H. Hernial repair using Cooper's ligament: follow-up studies on 367 operations. *Arch. Surg.* **35**: 689-709, 1947.
7. Koontz, A. R. Preliminary report on use of tantalum mesh in repair of ventral hernias. *Ann. Surg.* **127**:1079-1085, 1948.
8. *Idem.* Tantalum mesh in hernia repair: experimental and clinical results. Presented at the sixtieth annual session of the Southern Surgical Association, White Sulphur Springs, West Virginia, December 7-9, 1948.
9. Throckmorton, T. D. Tantalum gauze in repair of hernias complicated by tissue deficiency: preliminary report. *Surgery* **23**:32-46, 1948.
10. Blakemore, A. H. Portacaval anastomosis. *Surg., Gynec. & Obst.* **87**: 277-279, 1948.
11. Linton, R. R., Hardy, I. B., Jr., and Volwiler, W. Portacaval shunts in treatment of portal hypertension: analysis of 15 cases with special reference to suture type of end-to-side splenorenal anastomosis with splenectomy and preservation of kidney. *Surg., Gynec. & Obst.* **87**:129-144, 1948.
12. Welch, C. S. Technique for portacaval anastomosis (Eck fistula). *Surg., Gynec. & Obst.* **85**:492-494, 1947.
13. Everson, T. C., and Cole, W. H. Ligation of splenic artery in patients with portal hypertension. *Arch. Surg.* **56**:153-160, 1948.
14. Phemister, D. B., and Humphreys, E. M. Gastroesophageal resection and total gastrectomy in treatment of bleeding varicose veins in Banti's syndrome. *Ann. Surg.* **126**:397-410, 1947.
15. Wangensteen, O. H. Discussion of Phemister and Humphreys.[14]
16. Pemberton, J. deJ. Discussion of Phemister and Humphreys.[14]
17. Blalock, A. Discussion of Phemister and Humphreys.[14]
18. Waugh, J. M. Radical resection of head of pancreas and total pancreatectomy. *J. A. M. A.* **137**:141-144, 1948.
19. Cattell, R. B. Technic for pancreatoduodenal resection. *S. Clin. North America* **28**:761-775, 1948.
20. *Idem.* Appraisal of pancreatoduodenal resection. Presented at the sixtieth annual session of the Southern Surgical Association, White Sulphur Springs, West Virginia, December 7-9, 1948.
21. *Idem.* Anastomosis of duct of Wirsung: its use in palliative operations for cancer of head of pancreas. *S. Clin. North America* **27**: 636-643, 1947.
22. Bartlett, M. K. Status of pancreaticoduodenal resection. *S. Clin. North America* **27**:1032-1036, 1947.
23. Owens, F. M., Jr. Problem of peptic ulcer following pancreatectomy. *Ann. Surg.* **128**:15-20, 1948.
24. Thompson, M. D. Presented at the sixtieth annual session of the Southern Surgical Association, White Sulphur Springs, West Virginia, December 7-9, 1948.
25. Sainburg, F. P., and Garlock, J. H. Carcinoma of gall bladder: report of seventy-five cases. *Surgery* **23**:201-205, 1948.
26. Graham, E. A. Prevention of carcinoma of gall bladder. *Ann. Surg.* **93**:317-322, 1931.
27. Lahey, F. H. Further experiences with injured bile ducts: new method of repair. *New Eng. J. Med.* **240**:162-168, 1949.
28. Cole, W. H., Reynolds, J. T., and Ireneus, C., Jr. Strictures of common duct. *Ann. Surg.* **128**:332-347, 1948.
29. Longmire, W. P., Jr., and Sanford, M. C. Intrahepatic cholangiojejunostomy with partial hepatectomy for biliary obstruction. *Surgery* **24**:264-276, 1948.
30. Wilson, H., and Gillespie, C. E. Partial hepatectomy with intrahepatic cholangiojejunostomy. Presented at the sixtieth annual session of the Southern Surgical Association, White Sulphur Springs, West Virginia, December 7-9, 1948.
31. Grindlay, J. H. Method of making tubes of polyethylene film for use in anastomosis of common bile duct, trachea, and pelvic colon. *Surgery* **24**:20-29, 1948.
32. Best, R. R. Quantitative and qualitative control of bile flow and its relation to biliary tract surgery. *Ann. Surg.* **128**:348-362, 1948.
33. Hamilton, F. E. Gastric ulcer following radiation. *Arch. Surg.* **55**: 394-399, 1947.
34. Bowers, R. F., and Brick, I. B. Surgery in radiation injury of stomach. *Surgery* **22**:20-40, 1947.
35. Marshall, S. F., and Welch, M. L. Results of surgical treatment for gastric ulcer. *J. A. M. A.* **136**:748-752, 1948.
36. Pack, G. T., and McNeer, G. Incidence of gastric cancer. *Internat Abstr. Surg.* **86**:521-534, 1948.
37. Sweet, R. H. Treatment of carcinoma of esophagus and cardiac end of stomach by surgical extirpation. *Surgery* **23**:952-975, 1948.
38. Ulfelder, H., Graham, R. M., and Meigs, J. V. Further studies on cytologic method in problem of gastric cancer. *Ann. Surg.* **128**: 422-424, 1948.
39. MacDonald, R. M., Ingelfinger, F. J., and Belding, H. W. Late effects of total gastrectomy in man. *New Eng. J. Med.* **237**:887-896, 1947.
40. Friesen, S. R., Merendino, K. A., Baronofsky, I. D., Mears, F. B., and Wangensteen, O. H. Relationship of bone trauma to development of acute gastroduodenal lesions in experimental animals and in man: with particular reference to role of fat emboli. *Surgery* **24**: 134-159, 1948.
41. Meulengracht, E. Fifteen years' experience with free feeding of patients with bleeding peptic ulcer: fatal cases. *Arch. Int. Med.* **80**: 697-708, 1947.
42. Jones, F. A. Haematemesis and melaena with special reference to bleeding peptic ulcer. *Brit. M. J.* **2**:441 and 477, 1947.
43. Stewart, J. D., Schaer, S. M., Potter, W. H., and Massover, A. J. Management of massively bleeding peptic ulcer. *Ann. Surg.* **128**: 1-32, 1948.
44. Warren, R., and Lanman, T. H. Surgery in bleeding peptic ulcer: urgent operation and principle of exclusion. *Surg., Gynec. & Obst.* **87**:291-298, 1948.
45. Dunphy, J. E., and Hoerr, S. O. Indication for emergency operation in severe hemorrhage from gastric or duodenal ulcer. *Surgery* **24**:231-238, 1948.
46. Baker, C. Bleeding peptic ulcer. *Guy's Hosp. Rep.* **96**:1-56, 1947.
47. Allen, A. W. Duodenal ulcer: comparative survey of immediate and interim results on two groups of patients: one treated by subtotal gastrectomy, and other by vagus resection. *Ann. Roy. Coll. Surgeons of England* **1**:235-247, 1947.
48. Warren, R., and Meadows, E. C. Subtotal gastrectomy or vagotomy for peptic ulcerations: early results and postoperative symptoms. *New Eng. J. Med.* **240**:367-372, 1949.
49. Moore, F. D. Vagus resection for ulcer: interim evaluation. *Ann. Surg.* **126**:664-678, 1947.
50. Colp, R., Klingenstein, P., Druckerman, L. J., and Weinstein, V. A. Comparative study of subtotal gastrectomy with and without vagotomy. *Ann. Surg.* **128**:470-478, 1948.
51. Walters, W., Neibling, H. A., Bradley, W. F., Small, J. T., and Wilson, J. W. Study of results, both favorable and unfavorable, of section of vagus nerves in treatment of peptic ulcer. *Ann. Surg.* **126**:679-686, 1947.
52. Faxon, H. H., and Schoch, W. G., Jr. Gastrojejunocolic fistula: review of nine cases, with use of vagus resection as part of operative procedure in one. *New Eng. J. Med.* **240**:81-87, 1949.
53. Priestly, J. T., and Gibson, R. H. Gastrojejunal ulcer: clinical features and late results. *Arch. Surg.* **56**:625-641, 1948.
54. Ravitch, M. M. Anal ileostomy with sphincter preservation in patients requiring total colectomy for benign conditions. *Surgery* **24**:170-187, 1948.
55. McGuff, P., Dockerty, M. B., Waugh, J. M., and Randall, L. M. *Surg., Gynec. & Obst.* **86**:273-288, 1948.
56. Spackman, J. G. Obstructive lesions of small intestine and sigmoid due to irradiation. *Ann. Surg.* **127**:121-127, 1948.
57. Swenson, O., and Bill, A. H., Jr. Resection of rectum and rectosigmoid with preservation of sphincter for benign spastic lesions producing megacolon: experimental study. *Surgery* **24**:212-220, 1948.
58. Kiefer, E. D. Evaluation of clinical management of chronic ulcerative colitis. *Gastroenterology* **10**:16-27, 1948.

59. Dennis, C., Eddy, F. D., Frykman, H. M., McCarthy, A. M., and Westover, D. Response to vagotomy in idiopathic ulcerative colitis and regional enteritis. *Ann. Surg.* **128**:479-496, 1948.
60. Cattell, R. B., and Sachs, E., Jr. Surgical treatment of ulcerative colitis. *J. A. M. A.* **137**:929-935, 1948.
61. Best, R. R. Consideration for surgery in ulcerative colitis. *Am. J. Digest. Dis.* **14**:388-392, 1947.
62. Crohn, B. B., Garlock, J. H., and Yarnis, H. Right-sided (regional) colitis. *J. A. M. A.* **134**:334-338, 1947.
63. McKittrick, L. S. Principles old and new of resection of colon for carcinoma. *Surg., Gynec. & Obst.* **87**:15-25, 1948.
64. Jones, T. E., Robinson, J. R., and Meads, G. B. One hundred and thirty-seven consecutive combined abdominoperineal resections without mortality. *Arch. Surg.* **56**:109-116, 1948.
65. Dixon, C. F. Anterior resection for malignant lesions of upper part of rectum and lower part of sigmoid. *Ann. Surg.* **128**:425-442, 1948.
66. Wangensteen, O. H., and Toon, R. W. Primary resection of colon and rectum with particular reference to cancer and ulcerative colitis. *Am. J. Surg.* **75**:384-404, 1948.
67. Bacon, H. E., and Rowe, R. J. Surgery of lower bowel: preparation and after-care of patient. *J. A. M. A.* **136**:975-979, 1948.

CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL

Weekly Clinicopathological Exercises

FOUNDED BY RICHARD C. CABOT

TRACY B. MALLORY, M.D., *Editor*

BENJAMIN CASTLEMAN, M.D., *Associate Editor*

EDITH E. PARRIS, *Assistant Editor*

CASE 35211

PRESENTATION OF CASE

A sixty-five-year-old machinist was well until three months before admission, when he consulted his physician because of progressive weakness and a persistent upper respiratory infection. He had a "mild cough" productive of a small amount of mucoid sputum. There was no hemoptysis, no pain and no exertional dyspnea. Since the onset of his illness he noted difficulty in breathing during bad weather. For the two months preceding admission he was confined to bed. During this time his weakness progressed, and just prior to admission his sputum increased in amount. There was no history of fever, night sweats or wheezing. There was a 17-pound weight loss in these three months. In the month prior to admission he developed hoarseness and diminished hearing.

Physical examination on admission showed a dehydrated, cachectic and slightly cyanotic man. There was a cataract on the right, and posterior superior synechia with fixation of the right pupil. There was no gross loss of hearing. There was a palpable lymph node in the left supraclavicular fossa, and the trachea was markedly deviated to the left. There were hard movable lymph nodes, measuring 1 cm. diameter or more, in both axillas. There was dullness to percussion posteriorly on the left below the level of the eighth rib, and bronchophony and absent breath sounds over the same area. The heart was normal in size, with a regular rate, and free of murmurs.

The temperature was 100° F., the pulse 90, and the respirations 30. The blood pressure was 88 systolic, 64 diastolic.

Examination of the blood disclosed a hemoglobin of 12 gm. and a white-cell count of 25,800, with 91 per cent neutrophils. Urinalysis was negative. A stool was guaiac negative. Blood culture was negative. Repeated sputums and gastric washings were negative for acid-fast organisms. The prothrombin time was 17 seconds (normal, 15 seconds). The nonprotein nitrogen was 19 mg., and the total protein 5.8 gm. per 100 cc.

A chest film was reported as follows:

> There is collapse of the left upper lobe and partial collapse of the left lower lobe. The mediastinum is shifted to the left. Within the collapsed segment, there are several flecky densities and a suggestion of small punctate calcifications. The left costophrenic sinus is blunted, and the left leaf of the diaphragm is not visualized. There is also partial collapse of the right upper lobe, with irregular increase in density and punctate calcifications; also, there is some thickening of the overlying pleura. The right lower and right middle lobes are overexpanded, and they herniate into the left side of the chest anteriorly. The right leaf of the diaphragm moves freely and is elevated somewhat anteriorly. The patient was given a swallow of barium, and the esophagus showed no obstruction, although it was deviated to the left by the collapse on that side.

The patient's course in the hospital was febrile, the temperature varying between 99 and 104°F. At times he was disoriented and incoherent. An electroencephalogram was reported as a borderline record. A lumbar puncture showed normal pressure, and the spinal fluid was normal. Penicillin was given, with no effect on the febrile course. A chest film taken sixteen days following the first film was reported as follows:

> The left chest is now entirely dense. A few air-containing areas shine through in the central portion that look like small abscessed cavities. How much of the density in the left side is due to consolidation atelectasis, or drowned infiltration, or how much to fluid in the pleural sinus is not determinable. There are areas of infiltration in the right apex and first and second interspaces, with small areas of cavitation interspersed.

The patient's course remained febrile, and terminally respirations became rapid, and he died of respiratory failure on the thirty-eighth hospital day.

DIFFERENTIAL DIAGNOSIS

DR. ARTHUR PIER: In summary, we have a sixty-five-year-old man who was perfectly well until recently, when he developed a cough, fatigue, weakness, weight loss and x-ray evidence of bronchial obstruction and pulmonary infiltration and then went rapidly downhill to die, with fever, leukocytosis and a low-grade anemia accompanying his hospital course. We do not get much information from the physical examination of the chest except to learn that there was disease present. I wonder

if we can look at the x-ray films. I believe they were taken two weeks apart.

DR. STANLEY M. WYMAN: They show the mediastinum and heart to be displaced toward the left, with rather mottled density occupying the distribution of the left upper lobe and to a lesser extent in the left lower lobe. Unfortunately, the films are not penetrated sufficiently to outline the bronchi well, but on the second examination, one can trace the left main bronchus down to the region of the upper and lower lobe branches, at which point it is impossible to trace the bronchi farther. The multiple areas of infiltration in the collapsed right upper lobe are well seen, and there is definite calcification within them. I am not able to be certain of calcification in the left-lung field.

DR. PIER: Do you see any involvement of the mediastinum, or can you tell?

DR. WYMAN: It is impossible to see it adequately.

DR. PIER: Has there been any change in the right apex between the first and second films?

DR. WYMAN: There is a suggestion that there had been some added density in the lower portion of the diseased area. It does suggest a progression of some infiltrative or consolidating process.

DR. PIER: I must say that I am a little nonplussed by these films and a little less certain about the diagnosis than I was on reading the protocol because these calcified flecks in the right apex represent old, healed, burned-out tuberculosis. I cannot attach to them any further significance. I do not believe that tuberculosis was an active participant in the patient's very rapid decline

Could he have had some bizarre infiltrative process in the lung such as a mycotic infection — for example, actinomycosis? It is my impression that actinomycosis, although often involving both lungs, usually involves the lower portions of the lungs rather than the upper. It is an invasive disease, which causes necrosis and small abscess formation and spreads relentlessly, without regard to any barrier through lung tissue, pleura and chest wall, creating on its way fistulas and sinus tracts. A patient with actinomycosis frequently raises large amounts of yellow sputum in which can be found the characteristic sulfur granules. I do not see any evidence here on which to base a diagnosis of actinomycosis or of any other mycotic infection.

Nor do I believe he had a necrotizing pneumonia. The onset was too insidious and the course was too long.

The history in a sixty-five-year-old man of cough, weight loss, bronchial obstruction and pulmonary collapse, with rapid deterioration leading to death, spells bronchiogenic carcinoma to me, and very little else. I am going to cling to that diagnosis although I am somewhat disturbed by the bilateral nature of this man's disease. I do not see why it could not have been bilateral if it had gone far enough. His symptoms and his course are more consistent with bronchiogenic carcinoma than with anything else. His mucoid sputum, even though not bloody at any time, is characteristic of bronchial irritation and is often seen, in the early stages at least, in cases of bronchiogenic carcinoma. His fever, pronounced leukocytosis and low-grade anemia are also entirely compatible with a diagnosis of bronchiogenic carcinoma and are probably indicative of pulmonary infection peripheral to the obstruction. The early course of bronchiogenic carcinoma is often insidious and deceptive. Frequently, there are no noteworthy symptoms or signs until it is far advanced. Certainly, if that is what this man had, and I am sure it is, it was way out of possible therapeutic bounds by the time he developed outstanding symptoms.

It is perhaps a little academic for me to try to determine what type of cell his cancer arose from. The three types generally classified are: the small-cell, or oat-cell carcinoma; the adenocarcinoma; and the epidermoid, or squamous-cell carcinoma.

The oat-cell, or small-cell type, is a very malignant variety that usually arises in or near the hilus and tends to invade the mediastinum, often getting tangled up with the aorta and great veins and often causing symptoms of mediastinal compression. It infiltrates lung tissue and metastasizes widely via the lymphatics to distant parts of the body — to the liver, lymph nodes, bone, adrenal glands, brain and other organs. It usually occurs in a somewhat younger age group than this man falls into. It is impossible to tell by looking at this patient's films whether the mediastinum was extensively involved or not. He developed hoarseness, however, and hoarseness implies involvement of the recurrent laryngeal nerve.

The adenocarcinomas usually arise somewhat more peripherally in the bronchial tree and form round masses and invade the lung tissue extensively and metastasize widely via the blood stream to the liver, opposite lung and brain.

The epidermoid, or squamous-cell, variety grows more slowly than the others, metastasizes less widely and is the most amenable to surgical resection. Like the other types it invades the lung tissue and spreads to the hilar lymph nodes.

Finally, there is a cell type that is so undifferentiated that it cannot be well classified.

All these carcinomas cause bronchial obstruction with atelectasis, damming-up of bronchial secretions and often pneumonitis, frank suppuration, and all the evidence of infection.

I think this patient had a very rapidly growing bronchiogenic carcinoma, probably of an undifferentiated variety and probably arising in the left-upper-lobe bronchus. I would guess that it also involved the left-lower-lobe bronchus and spread across the trachea to involve the right-upper-lobe bronchus. I think the left lung will be found to be extensively invaded by tumor, and I think there

was abscess formation secondary to this tumor invasion, partly from obstruction and partly, perhaps, from necrosis of the cancer itself. I rather think that a good deal of what we see in the right apex is tumor. A massive, left pleural effusion seems to have developed terminally and probably contributed to his death.

The only diagnosis I can make is bronchiogenic carcinoma, probably of an undifferentiated sort. I do not see any very good evidence for distant metastases except the lymph nodes in the axilla and supraclavicular region, which were undoubtedly involved. I do not think that we need to postulate adrenal or cerebral involvement to account for his relatively low blood pressure on the one hand and for his disorientation on the other. I think they could be nonspecific findings that might occur in any very sick, dehydrated, cachectic man.

DR. JOSEPH C. AUB: Dr. Pier did better than we did on the ward.

DR. TRACY B. MALLORY: Do you want to discuss it?

DR. AUB: No.

DR. MALLORY: Does anyone want to take up the cudgels for tuberculosis?

DR. HELEN PITTMAN: I took them up when Dr. Aub showed me the films on the ward the other day.

DR. LAMAR SOUTTER: It is worth commenting from the tuberculosis standpoint that one occasionally sees older people who have considerable tuberculosis without positive sputum. We had one such patient a few years ago with progressive collapse of one lung from whom several sputum specimens were examined but were never positive until the day before operation.

DR. EDWARD B. BENEDICT: I recall doing a bronchoscopy on an elderly man eight years ago. The gross appearance of the bronchi was consistent with cancer. The pathology report was tuberculosis, and I think we had seriously considered tuberculosis. But I must admit that we see both cancer and tuberculosis in the same patient.

DR. J. GORDON SCANNELL: Is it fair to ask if he was bronchoscoped?

DR. BENEDICT: He was probably too sick.

CLINICAL DIAGNOSIS

Pulmonary tuberculosis.

DR. PIER'S DIAGNOSIS

Bronchiogenic carcinoma, undifferentiated, left-upper-lobe bronchus, with involvement of entire left lung and apex of right lung.

ANATOMICAL DIAGNOSES

Oat-cell carcinoma of left main bronchus, with metastases to brain, liver, adrenal gland and lymph nodes.

Atelectasis, severe, left lung.

Organizing pneumonia, slight focal, left lung.

Pulmonary tuberculosis, chronic, active, right lung.

PATHOLOGICAL DISCUSSION

DR. MALLORY: Autopsy showed extensive carcinoma in the left main bronchus, which had spread extensively into the lung. The tumor was adherent to, and narrowed by compression, both the aorta and the esophagus but did not invade either organ. The remainder of the left lung showed some foci of old organizing pneumonia and almost complete atelectasis. There was no fluid in the pleural cavity, and the apparent consolidation was due to complete absence of air in the pulmonary parenchyma. There was extensive old tuberculosis at the right apex, and other foci in the right lung, which were not entirely inactive. Some fresh tubercle formation was found. and it is quite conceivable that he might have shown positive sputum, from time to time. The tumor had metastasized very widely. The bronchial lymph nodes and nearly all the retroperitoneal peripheral nodes were involved. There were metastases in the liver and one in the adrenal gland, but the most notable metastases were in the brain, where some forty or fifty small separate tumor nodules were found widely scattered through all parts of the brain cortex, white matter and the cerebellum, but were not of sufficient size to have produced localizing symptoms.

DR. AUB: What kind of tumor was it?

DR. MALLORY: An oat-cell carcinoma.

DR. PITTMAN: Was the disease on the right all tuberculosis?

DR. MALLORY: Yes; there was no tumor there.

CASE 35212

PRESENTATION OF CASE

First admission. A fifty-six-year-old Russian physician was admitted for diagnosis and treatment of a lung tumor.

Twenty-seven years before this admission he was treated with bed rest for six months because of tuberculosis in the left upper lung. Nine years before this admission while he was being routinely fluoroscoped, a lesion the size of a dime was detected in the same location as the previous tuberculous infection. At this time he was practicing medicine and was symptom free. Six years before this admission, while he was having a gastric series, during the investigation of a possible duodenal ulcer, the chest lesion was seen again now the size of a quarter. Many x-ray films were taken until three years before admission, when the patient decided to forget the whole matter. These films were all available for examination when he was admitted to this hospital. Some of them taken about four or five years before

admission showed definite regression in size of the lesion until it was about the same size or even smaller than when found originally nine years previously. The decrease in size was a shrinkage of the shadow, rather than a central destruction. The lesion then (three or four years before entry) returned to the same size or larger than it had been six years before entry.

Two months before admission he had a short illness accompanied by chills, fever and blood-streaked sputum for one day only. An x-ray examination showed still further enlargement of the lung lesion. There was no chest pain, dyspnea, joint symptoms, weight loss or loss of appetite. He did have occasional bouts of productive coughing.

The temperature, pulse and respirations were normal. The blood pressure was 130 systolic, 90 diastolic. Physical examination was negative. The hemoglobin was 14.6 gm., and the white-cell count 6800, and urinalysis was negative. Sputum examination was negative for acid-fast bacilli.

A chest x-ray examination was reported as follows:

Lying in the left mid-lung field in the anterior segment of the left upper lobe is a lobulated homogeneous mass approximately 5.0 by 4.8 by 6.0 cm., in which no calcification is recognized. The superior portion of this mass shows an unusual degree of lobulation. The lesion lies in intimate contact with the minor fissure, separating the left-upper from an anomalous left-middle lobe (Fig. 1). There is no apparent extension through the fissure, and the lung fields appear clear, except for a few calcified scars in the upper-lung fields. Definite hilar or mediastinal lymph nodes are not recognized, although there is a suggestion of an ill defined similar density just above the left main bronchus. Spot films of the lesion show a suggestion of a division of the mass into possibly three component parts, the strongest suggestion being in the upper portion. A review of previous films shows the superior and lateral portions of the mass to be of more recent origin than the medial lower portion.

FIGURE 1.

Exploratory thoracotomy was proposed but the patient left the hospital to settle his affairs.

Second admission (two and a half months later). The patient continued to have a cough with sputum and occasional blood streaking. On a repeat chest x-ray examination it was reported that "the superior lobulation of the mass appears to be slightly larger than at the last examination; otherwise there is little if any change." The sputum was again negative for acid-fast bacilli. On the seventh hospital day an operation was performed.

DIFFERENTIAL DIAGNOSIS

DR. RICHARD SCHATZKI: The record mentions a series of films dating back nine years prior to admission. These films are not available now. I would like to see the films and not take someone else's word for them. I will have to do so, and for the sake of this exercise I will assume that the interpretation was correct and did not show any more than is given in the record.

I will start with the x-ray films. There is very little I can add to the description as given in the record. There are two striking features about this mass. One is the marked lobulation. It is really segmentation, as if the mass had originated from more than one place; possibly, it arose from more than one focus. Another interesting feature is the fact that the point of attachment of the mass, at this anomalous fissure between the left middle and upper lobes, shows surprisingly little if any bulging. The second striking thing about this mass is its duration, if we can assume that what we see now has been present for at least nine years. The mass is reported to have markedly decreased in size at one time, and to have increased again. It is also a mass that had in no way handicapped the general well-being of the person who had it. That is a rather unusual story. If one did not have the history and just looked at the films, things would be much easier. I should like to ask one or two questions, which are not in the record, in order to exclude certain things, which I think can be excluded fairly rapidly. There is no differential count mentioned. How many eosinophils were there?

DR. TRACY B. MALLORY: None.

DR. SCHATZKI: No blood Hinton test is mentioned.

DR. MALLORY: I can find no record of that. Do you remember, Dr. Scannell?

DR. J. GORDON SCANNELL: I do not, but I assume it was negative.

DR. SCHATZKI: That is enough.

There are numerous lesions that might occasionally produce a shadow in the lung, as this one did. I am not going to enumerate all of them. I will mention a few likelier ones rather than other

rarer ones. There are four conditions, if we exclude echinococcal cyst and the very rare gumma of the lung, which conceivably could produce such a picture and such a history. A bronchiogenic cyst would explain the fluctuation in size, which occurred during observation. It is very difficult to explain the appearance of the lesion on that because of the marked lobulation. I do not remember having seen or heard of a segmented bronchiogenic cyst. It is conceivable but so unlikely that I will exclude the possibility. The second is benign adenoma in the periphery of the lung. Benign adenoma occurs practically always in the large bronchi. It rarely occurs in the periphery, but we have seen in these exercises at least 2 cases in which benign adenoma did occur in the periphery of the lung. In favor of it would be the marked lobulation. The shape would be consistent. The absence of any appreciable amount of atelectasis — in the last film a small amount is visible — and the rather recent clinical history make me believe that it is not so very probable. I put particular stress on the definite decrease in the size of the lesion, which we are going to take for granted. If we exclude these possibilities, there are two left that are uppermost in our minds: primary malignant tumor of the lung and tuberculoma. The history, of course, points very strongly toward the latter possibility. Could this have been a tuberculoma? The present x-ray appearance is consistent with a diagnosis of tuberculoma, although it is a little different from the tuberculomas that I remember having seen. It is unusual for tuberculoma to have such a sharp edge. Usually there is some scarring or small area of atelectasis, which produces the appearance seen in the corona of the sun. But I can conceive that this does not always have to be so, and it may be tuberculoma. How about the history? I have seen a case in which a tuberculoma grew under observation and was proved by operation. It would be a little more difficult to see how a tuberculoma could shrink and then start to grow again. As a matter of fact that statement is unusual for anything I can think of.

The last possibility I am going to discuss is that of malignant tumor of the lung. Could this have been a bronchiogenic carcinoma of the lung? If we had x-ray films alone and no history this would be our first bet. It is a little difficult to reconcile the history with this diagnosis. Can someone have bronchiogenic carcinoma for nine years, and have no more symptoms than this man had? Certainly I have never seen one, although I can conceive that it might be possible. Bronchiogenic carcinoma is a more slowly growing carcinoma than we usually assume. However, it is difficult to see how bronchiogenic carcinoma could decrease in size without evidence of ulceration, and one would be forced to make two diagnoses. I would say that my choice is between tuberculoma and malignant tumor in the lung. If the two lesions are the same it will have to be tuberculoma. If it just happens to be in the area where the patient had had old tuberculosis, I would make bronchiogenic carcinoma my first bet. For the record's sake I have to choose one of the two, and I shall therefore take bronchiogenic carcinoma as my first choice, and tuberculoma as my second.

Dr. Joseph C. Aub: I am surprised at that diagnosis. The record states that this lesion was situated between two lobes and from here it looks like a cyst. The patient came from Russia even though he did not have a high eosinophil count. Why could it not have been a hydatid cyst, since it lay between the two lobes?

Dr. Schatzki: When I read the record without seeing the films, I made a diagnosis of echinococcal cyst. When I saw the films, I still thought it could be an echinococcal cyst. If I had been the clinician I would have done all that was necessary to rule that possibility out; I could not do that here. The only thing I could ask for here was the eosinophil count because I realized I would not get an answer if I asked for the result of a complement-fixation test for echinococcus. For that reason I had to exclude it from my differential diagnosis. I agree, from the history, that it could be, however.

Dr. Aub: Does the mass lie between the two lobes?

Dr. Schatzki: No; I would say it lies in the lobe.

Dr. Alfred Kranes: Is it possible that the repeated chest x-ray examinations that he had would affect a sensitive tumor?

Dr. Schatzki: Not the amount he apparently had.

Dr. Edward B. Benedict: Was a bronchoscopy done?

Dr. Scannell: No.

Dr. Benedict: Was there any reason for not doing one?

Dr. Scannell: Yes, because of the peripheral nature of the lesion. Opinion was divided into two camps. We joined the camp that thought he ought to be operated on.

Dr. Benedict: I agree that he certainly had to be treated as a cancer patient, but I would have bronchoscoped him on the chance of finding a finger-like process in the left-upper-lobe bronchus with a right-angle bronchoscope and obtaining washings for a cytologic study. Even if it were negative, I would still explore.

Dr. Scannell: That was our viewpoint. We did not see how it would change the therapy.

Dr. Lowrey F. Davenport: I would like to ask a general question. The statement has been made that on a percentage basis peripheral tumors are more apt to be adenocarcinoma. Dr. Siegfried J. Thannhauser called my attention to the fact that he was certain that the ones that shelled out forming abscesses were more apt to be epidermoid than adenocarcinoma. What would you say to that as a differential point in the case of a solitary tumor in the periphery of the lung?

DR. MALLORY: Most of our abscesses have been either with epidermoid or with oat-cell tumors, rather than adenocarcinomas.

DR. STANLEY M. WYMAN: It is worth stating, as the record says, that careful review of the old films convinced us, at least, that the nodule had been in the same location from the first examination, and represented a part of the mass that we now see.

DR. SCANNELL: My impression is that a complement-fixation test was done before he came here and was negative. He was Russian born, but had lived in South Africa for twenty years. He had had the whole gamut of studies done by all his medical friends every place he went. Our opinion as we stood at the operating table was similar to Dr. Schatzki's. Before we operated Dr. Edward D. Churchill, at least, said that he thought it was a tuberculoma, and we were prepared to give streptomycin. On opening the chest we found a complete left middle lobe, and in the anterior segment of the left upper lobe was a puckered area with an underlying mass, no overlying pleural adhesions and very little injection of the surrounding lung or pleura. A left upper lobectomy was done. A biopsy was also taken since we believed at that point that it was probably tumor rather than tuberculoma. There were no involved lymph nodes, and the hilar areas were clear. There were minimal adhesions at the left apex.

CLINICAL DIAGNOSIS

Tuberculoma?

DR. SCHATZKI'S DIAGNOSIS

Bronchiogenic carcinoma?
Tuberculoma?

ANATOMICAL DIAGNOSIS

Adenocarcinoma, left-upper-lobe bronchus.

PATHOLOGICAL DISCUSSION

DR. MALLORY: The specimen we received showed a lobular, very sharply circumscribed but nonencapsulated tumor, which, on microscopical examination, proved to be a very well differentiated adenocarcinoma. Portions of the tumor were, in my opinion, better differentiated than any cancer of the lung that we have ever seen, and yet there can be no doubt about its malignancy. It appeared to be still relatively slowly growing, and I believe the tumor could have been present for a large part of the recorded history. We did not find any other lesion that would explain the previous shrinkage of the shadow.

DR. SCHATZKI: Do you have any explanation how that might occur?

DR. MALLORY: No, I have not. This was an extremely solid tumor, rather scirrhous, in fact, which is unusual in a pulmonary tumor, and it is very hard for me to see how it could have shrunk.

DR. BENJAMIN CASTLEMAN: The scirrhous character might mean that there had been previous necrosis of the tumor, which had caused it to shrink.

DR. MALLORY: It is possible, but there are so many sclerosing tumors in which one has no such evidence of episodes of necrosis that I do not think we can draw such a conclusion safely.

DR. SOUTTER: What is the possibility of a metastatic adenocarcinoma?

DR. MALLORY: I cannot rule out that possibility.

DR. SCANNELL: That was probably ruled out clinically from previous studies. The tests were not done here, but barium studies and pyelograms carried out elsewhere were all negative.

DR. MALLORY: The tumor involved the entire bronchial segment and was growing into the lumen of the bronchus in a fashion characteristic of primary tumor. Of course we do know that metastatic tumors occasionally grow intraluminally.

DR. SCHATZKI: What caused the extreme segmentation — just the shape of the tumor?

DR. MALLORY: Yes.

The New England
Journal of Medicine

Formerly
The Boston Medical and Surgical Journal
Established 1828

Official Organ of
THE MASSACHUSETTS MEDICAL SOCIETY
and
THE NEW HAMPSHIRE MEDICAL SOCIETY

OWNED BY THE MASSACHUSETTS MEDICAL SOCIETY AND PUBLISHED WEEKLY UNDER THE JURISDICTION OF THE COMMITTEE ON PUBLICATIONS

Richard M. Smith, M.D., *Chairman*
James P. O'Hare, M.D. Conrad Wesselhoeft, M.D.
Oliver Cope, M.D. John Fallon, M.D.
Joseph Garland, M.D., EDITOR
ASSOCIATE EDITORS
Thomas H. Lanman, M.D. Donald Munro, M.D.
Henry Jackson, Jr., M.D.
Clara D. Davies, EXECUTIVE EDITOR
Robert O'Leary, ASSISTANT EDITOR
EDITORIAL BOARD
C. Guy Lane, M.D. Maxwell Finland, M.D.
Henry R. Viets, M.D. James M. Faulkner, M.D.
Robert M. Green, M.D. Carroll B. Larson, M.D.
Dwight O'Hara, M.D. Francis D. Moore, M.D.
Fletcher H. Colby, M.D. C. Stuart Welch, M.D.
Robert L. Goodale, M.D. Vernon P. Williams, M.D.
Chester M. Jones, M.D. Benjamin Castleman, M.D.
Harvey R. Morrison, M.D. Hugh R. Leavell, M.D.

SUBSCRIPTION TERMS: $7.00 per year in advance, postage paid, for the United States (medical students, $4.00 per year); Canada, $8.00 per year (Boston funds); $9.50 per year for all foreign countries belonging to the Postal Union.

MATERIAL should be received not later than noon on Thursday, three weeks before date of publication.

THE JOURNAL does not hold itself responsible for statements made by any contributor.

COMMUNICATIONS, *including those concerning classified advertising but not those regarding other advertising*, should be addressed to the *New England Journal of Medicine*, 8 Fenway, Boston 15, Massachusetts. Telephone KE 6-2094.

NEW ENGLAND ADVERTISING REPRESENTATIVE (*except for classified advertising*): Edwin B. Tyler, 89 State Street, Boston, Massachusetts. Telephone LA 3-5516.

AMERICAN ACADEMY OF GENERAL PRACTICE

THE first annual clinical meeting of the Massachusetts Chapter of the American Academy of General Practice, which was held in Boston on April 15, not only represents the growing extension of chapters of the Academy (which have been formed in almost all the states) but also recalls the principles and goals of the organization. The purposes of the Academy, as stated in its constitution, are as follows: to promote and maintain high standards of general practice of medicine and surgery; to encourage and assist young physicians in preparing, qualifying and establishing themselves in general practice; to protect the right of the general practitioner to engage in medical and surgical procedures for which he is qualified by training and experience; to assist in providing postgraduate study for general practitioners and to encourage and assist physicians and surgeons to participate in this training; and to advance medical science and private and public health. The Academy at present has a membership of more than 10,000, and the potential membership includes more than 100,000 general practitioners.*

The officers of the Massachusetts Chapter include Dr. John R. Fowler, of Spencer, as president; Dr. Lewis S. Karp, of Worcester, as vice-president, and Dr. James G. Simmons, of Fitchburg, as secretary-treasurer. The directors are Dr. Nathaniel N. Bennett, of Springfield, Dr Harold F. Brown, of Brookline, and Dr. Fred L. Campbell, of Brighton. The activities of the first annual meeting comprised ward rounds, clinics and lectures on such varied subjects as psychosomatic illness, premarital counseling, the Rh factor, hypertension and virus diseases, all presented with particular attention to the interests of the general practitioners.

At the first scientific assembly of the Academy, held in Cincinnati early in March, the attendance was more than twice the number that had been anticipated. Meetings of the various chapters have evoked a similar interest.

The Academy, which represents at once the oldest of the medical arts and the newest of the specialties, is the result of a conviction among groups of general practitioners in several states that progress in medicine and surgery is basic to the welfare of the people and, incidentally, of the medical profession. As he takes his place among his fellows in more dramatic (and often more remunerative) specialties, the general practitioner epitomizes the best and most familiar aspects of medical practice. His role of healer, counselor and friend in time of need is a bulwark against interference with the free practice of medicine.

*First scientific assembly is outstanding success. *Gen. Practice News* 2: 1, April, 1949.

"FETUS AND NEWBORN"

THE strength of a nation may be said to depend primarily on the care and training of its young. Such a statement, no doubt true, can nevertheless be variously interpreted. In the city-state of Sparta

artificial means were added to the method of natural selection: the weak infants were exposed upon the hillsides, and only the strong survived to be subjected to the rigid discipline of the nation. Under conditions imposed at the highest levels of modern civilization, total survival is sought, for better or for worse, with quality to be attained through environmental influences rather than by the processes of natural selection.

In this country, still devoted to humanitarianism, every effort, come what may, is bent toward both the preservation and the betterment of life.

The American Academy of Pediatrics, in a relatively short existence, has already made two important contributions to child care. The second of these, the recently completed Study of Child Health Services, is already notable as the most exhaustive inquiry that has yet been made into the pediatric resources of the country; the earlier and continuing study, the work of the Academy's Committee on Fetus and Newborn, less ambitious in scope and less widely publicized, is nevertheless hardly of less importance.

In 1943 the Committee on Fetus and Newborn, working with the Children's Bureau, assisted in developing "Publication 292" of the Bureau — its manual, *Standards and Recommendations for the Hospital Care of Newborn Infants — Full-Term and Premature.* Continuing its program of developing and improving facilities for the hospital care of newborn infants and aided by state groups covering the entire country, the Committee, under the chairmanship of Dr. Stewart H. Clifford, of Boston, last fall presented its completed manual.

This manual, as its title implies, embodies a most acceptable and inclusive set of standards for the hospital care of newborn infants. It is particularly timely at a period during which deficiencies in hospital personnel have combined with an increased popularity of hospital lying-in to make the risks of neonatal infection a very real hazard.

No hospital that offers obstetric facilities can afford to operate its nursery along lines other than those established by the committee. In this instance the benefits of uniform procedure far outweigh its disadvantages.

MENE MENE

THE New York County Medical Society, which last winter "disapproved" the assessment and twelve-point program of the American Medical Association, has seen new writing on the wall. Repenting of the stand taken by a militant minority of the membership at the earlier session, a "huge attendance" at a later meeting on March 28 reversed the previous vote and recorded overwhelming approval of the present policies of the national association.

The general trend on the part of physicians is in the direction of adoption of the principles and acceptance of the program of the American Medical Association. Distrustful of the Association's conservatism, which has at times amounted to reaction, a number of its fellows at first hesitated to subscribe to its rejuvenated policies. These physicians, convinced of its integrity, are now joining the ranks in increasing numbers. A few, doubters to the last or devoted to the principles of paternalism in government, will never join. In general it may be said that the profession is presenting a stronger, more united front against the political control of medicine.

PRIZE ESSAY CONTEST

The *Journal* announces with pleasure the selection of the essay on Preventive Medicine by Miss Miriam D. Manning, a fourth-year student at Tufts College Medical School, as the winner of its 1949 prize essay contest. Miss Manning's essay will be published as the Medical Progress report on June 30. The prize was $100.00. The second prize, consisting of a two years' subscription to the *Journal* was won by Miss Suzanne Agnew, a member of the graduating class at the University of Minnesota Medical School.

The subject chosen for the next competition is "Recent Advances in the Study of Poliomyelitis." The conditions are the same as those that were published for the contest recently ended:

> Manuscripts are to be between four and five thousand words in length, clearly typewritten in English, double or triple spaced with references listed at the end in numerical arrangement according to the form used by the *Quarterly Cumulative Index Medicus.* They must be in the hands of

the editor by March 15, 1950. All manuscripts will become the property of the *Journal*.

A cash prize of $100.00 will be paid for the best essay of those found to be suitable for consideration; the paper will be published in the "Medical Progress" series that forms a regular part of the contents of the *Journal*, and the author will receive a hundred free reprints.

A second prize will consist of a two-year subscription to the *Journal*.

The editors wish to emphasize that in establishing this competition they are as much interested in encouraging good medical writing as they are in promoting the collection of scientific material. In judging papers that may be submitted, particular attention will accordingly be paid to clarity, simplicity and general literary excellence.

MASSACHUSETTS MEDICAL SOCIETY

DEATHS

DOBSON — William M. Dobson, M.D., formerly of Northampton, died on May 4. He was in his sixty-seventh year.

Dr. Dobson received his degree from Tufts College Medical School in 1907. He was a member of the American Psychiatric Association and the New England Society of Psychiatry.

Two daughters and a sister survive.

DORION — Kinton F. Dorion, M.D., of Lawrence, died on January 29. He was in his seventy-fourth year.

Dr. Dorion received his degree from Laval University in 1902. He was a fellow of the American Medical Association.

His widow, two daughters and a son survive.

GWINNELL — Alfred W. Gwinnell, M.D., of Boston, died on May 3. He was in his seventy-second year.

Dr. Gwinnell received his degree from Tufts College Medical School in 1911.

LOUGHRAN — James F. Loughran, M.D., of Lowell, died on April 17. He was in his eightieth year.

Dr. Loughran received his degree from Harvard Medical School in 1896.

Three sons and a sister survive.

MURPHY — John M. Murphy, M.D., of Brockton, died on April 24. He was in his sixty-eighth year.

Dr. Murphy received his degree from Tufts College Medical School in 1906. He was a fellow of the American Medical Association.

His widow, a son, a brother and two sisters survive.

SULLIVAN — John A. Sullivan, M.D., formerly of Pittsfield, died on April 8. He was in his sixty-fourth year.

Dr. Sullivan received his degree from Albany Medical College in 1910. He was a fellow of the American College of Surgeons and the American Medical Association.

His widow, a brother and two nephews survive.

NEW HAMPSHIRE MEDICAL SOCIETY

DEATH

RONDINELLA — Annina C. Rondinella, M.D., of Wellesley, Massachusetts, died on March 11. She was in her seventy-sixth year.

Dr. Rondinella received her degree from Woman's Medical College of Pennsylvania in 1899, and was assistant dean for several years. She was formerly a member of the medical departments at Vassar College and Connecticut College for Women and was consultirg ophthalmologist emeritus at Wellesley College. She was a fellow of the American Medical Association and a member of the Association for the Advancement of Science.

A brother and two nieces survive.

MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

CONSULTATION CLINICS FOR CRIPPLED CHILDREN IN MASSACHUSETTS

The June schedule for Consultation Clinics for Crippled Children in Massachusetts under the provision of the Social Security Act follows:

CLINIC	DATE	CONSULTANT
Haverhill	June 1	William T. Green
Lowell	June 3	Albert H. Brewster
Salem	June 13	Paul W. Hugenberger
Pittsfield	June 15	Frank A. Slowick
Worcester	June 17	John W. O'Meara
Springfield	June 21	Garry deN. Hough, Jr.
Hyannis	June 23	Paul L. Norton
Brockton	June 23	George W. Van Gorder
Fall River	June 27	David S. Grice

Physicians referring new patients to clinics should get in touch with the district health officer to make appointments. Patients are seen by appointment only.

SCHOOL MEDICINE IN MASSACHUSETTS

To no one are the deficiencies of school medical services more acutely a source of vexation than to the average school physician. Most school physicians, sooner or later, experience a sense of frustration and aimlessness regarding the methods and objectives of their school work, though often at the outset of their incumbency they may have high enthusiasm. School physicians are public-health officers; therefore, it is the responsibility of those who develop public-health policies to aid in working out a plan by which the health requirements of school children can be better understood and satisfied and by which the special health potentialities of medical services in these large groups of school children can be better utilized than hitherto by the physician directing each school health program. It will be necessary to provide some money – necessary perhaps to conduct a demonstration program in some selected school area, and necessary to seek the more active co-operation of the Massachusetts Medical Society. Since school medical inspections were initiated in this country, right here in Boston, when in 1894 the city was faced with a severe epidemic of the dreaded diphtheria, the improvement of school medical services should be of special interest in Massachusetts. One resolution announced by the Panel on School Health at the recent Massachusetts Health Conference favored the development of a section on school health by the Massachusetts Medical Society. The development of such a section should receive consideration.

To work for a brighter future, it is not necessary to lay the blame on the past, whether the dissatisfying experience was the result of low salaries or the low salaries the result of dissatisfying experience. The fault appears to lie with all who failed to realize until quite recently that school medicine has greater

possibilities than the mere duplication and underwriting of the work of the general practitioner. Strangely enough, the most suggestive, stimulating and penetrative analyses of school health possibilities have by no means all emanated from the medical profession. An example of this is the American Child Health Association, of which Herbert Hoover was president, which published in 1925 its health survey of eighty-six cities and later that of seventy cities and finally, before its liquidation, published the study known as *Physical Defects: Pathways to correction.*

Supported partly by funds from the liquidating committee of the American Child Health Association, partly by the Metropolitan Life Insurance Company and the Milbank Memorial Fund and by Social Security funds from the Children's Bureau, a fourth study known as the Astoria Demonstration Study was completed in a borough of New York City. These surveys provided much that was suggestive and constructive, and it is regrettable that the published reports are not more widely read.

Not until quite recently, however, has it become apparent that at least two, and probably three, wide fields are especially open to school medical practice. These are emotional health; child health education (I think I should also include adult education in child health); and studies of physical growth and the significance of deviations from standards, studies designed for use in large groups. Examples of such standards are the grids and graphs based upon various semiannual or more frequent measurements. In no way do I mean to imply that present activities of the school physician are to be abandoned. The search for physical defects and their correction and the prevention of communicable disease will not be less, but the physician's activities in the field of emotional health and of health education will be a great deal more.

Recognition of the importance of emotional health and the influences by which a child's emotions are swayed or damaged has not come too soon. Most parents are little aware of the importance of heedless acts or even inopportune absences upon the emotional health of their children. It is extremely important that parents be educated to an appreciation of these influences to prevent hurts that they do not wish to inflict. The problems of the child, whether physical or emotional, are best handled through prevention. It is a long hard row to rehabilitate a child with a tuberculous hip. How much better to prevent by eliminating the source. It is perhaps a longer and harder task to reclaim a happy and productive social being from an emotionally damaged child or — even worse — from the chronic delinquent.

The number of children and adolescents whose potential achievements are limited and crippled by emotional ill health is known to be extremely large. Emotional ill health is, in fact, the most common disease of the white race. Who has not suffered from its effects? What a huge loss to Society this disease entails! How many Lincolns, Holmeses or Churchills have sought the solitude of lesser fields rather than public life, because of emotional crippling! One speaks nowadays of "total health" meaning not merely the absence of detectable physical disease but also the full enjoyment of all the potentialities with which a person was endowed at birth.

The prevention of emotional ill health is a yet unappreciated gigantic task. It is to be obtained through education, not only of the child but also, even more especially, of its parents. Of the available community resources, especially since the curtailment of state child-guidance centers or clinics, the school physician, aided by alert and sympathetic teachers, nurses and counsellors, has the finest opportunity to provide such education.

We are thus upon the threshold of the second field of normal school health service — that of health education. By this I do not mean that the school physician should embark upon formal education. That function he should leave to trained educators. But he can teach by example during his examinations, inspections and other contacts with children and teachers as well, and should explain, as he proceeds, what he does and why he does it. He will also seek every opportunity to educate — the child by example and the parent, the teacher and the nurse by lectures and personal talks.

On the other hand, direction of the much more highly developed preventive aspects of the school health program will require a man who will know how to teach by example, who will know how environment can affect child health, who will know how to cope with an unfavorable environment and who will explain to parents their true relations to the emotional health of their children. Such responsibilities, which will require special training, can only mean that the practice of school health will be recognized as a specialty. The specialty has already been named by others, and its representatives are styled "pediatrician psychiatrists." Medical schools already furnish instruction designed to cover this field, but few men so equipped are yet available.

There are other reasons for a radical change in the type of school medical adviser who today is usually a man engaged also in general practice, and of these none is more important than the conflicting demands of his school health duties with those of general practice. It must be acknowledged, I think, that even today the proper demands of the school health program are incompatible with general practice. The hours of the school day will be none too long for the demands upon the school physician. An ideal school health program cannot permit the urgent demands of obstetrics, sur-

gery or other emergencies to interfere with the essentially regular school medical work. Furthermore, there is the problem of an adequate salary.

While discussing the problem of providing a trained, full-time school physician with the Board of a neighboring city, one of the Board members stated, "Why! Such a physician would require a salary of ten to twelve thousand dollars! It is more than we pay our superintendent. Your idea is impracticable." It is true that a pediatrician-psychiatrist school physician would expect to make twelve thousand dollars. But *is* that price too high? Is it not rather that the community has for many years indulged in the practice, so far as schools are concerned, of expecting too much for too little? It is also true that although the practice of school health is incompatible with general practice, with its demanding emergencies, there is no reason why the hours or interests of school work should prevent a substantial and remunerative consultative practice so that to the specialist a salary considerably less than twelve thousand dollars, since it is to be only a part of his income, would be attractive.

Some say that the general services of the full-time, trained staff of the organized communities are the answer to this problem. My own opinion is that one must look forward to such clinical facilities in rural communities–and be fortunate indeed to obtain them – as the best solution in areas of low resources. But I believe that the school needs its specialist physician: one who has the responsibility of school work at heart; who has the special interest in school children that is necessary; who will watch his children at play and at work; who will know their parents and their special problems; and who will have studied the school environment including each teacher and other school personnel. If it is objected that the average school population is too large for such detail, I shall answer that the large school population requires that the physician recognize his responsibility so to train the teacher's observation that he can count on her efficiency, so that he may delegate to her much of the important function of screening her pupils and concentrate himself upon those most in need of his study.

Shall one attempt to place a figure of value in dollars against the loss to society not by death, which has been estimated elsewhere, but by emotional ill health whether or not it is followed by delinquency? I believe that six or even twelve thousand dollars is a modest fee to pay for the means of helping to prevent such crippling, which is annually produced in any city.

It is hardly necessary to say that a sudden change from present methods to school medicine administered by a specialist is not to be expected. However, the future is not without promise. The Commissioner of Public Health in Massachusetts has an active interest in the development of better school medicine. At present the postgraduate education of physicians concerned with school work seems the most promising line of attack. An example of such education is the course first given last year, under the sponsorship by the Department of Public Health with the co-operation of the Harvard School of Public Health.

Such a course will probably be given annually. It is limited to forty participants. Interest on the part of school physicians is indicated by the fact that applications for most of these forty chairs were received this year within three weeks of the time of announcement, one from as far away as North Adams, one from Northampton and one from Greenfield.

ALLAN R. CUNNINGHAM, M.D.
Consultant in School Health

MISCELLANY

ISRAELI MEDICAL SCHOOL

The Hebrew University-Hadassah Medical School, the first medical school to be established in the new State of Israel, opened its doors May 17, 1949, as a joint undertaking of the Hebrew University and Hadassah, the Women's Zionist Organization of America. Until security conditions permit continuation of construction on Mt. Scopus, the site of the present 400-bed Rothschild-Hadassah-University Hospital, the School will be housed in four hospital units, totaling initially over 300 beds, in the city of Jerusalem proper.

UNIVERSITY PROFESSOR

Dr. Edwin J. Cohn, professor of biological chemistry in the Harvard Medical School and chairman of the Division of Medical Sciences in the Faculty of Arts and Sciences, has been appointed one of the four University Professors of Harvard University.

Long recognized for his work on proteins and the fractionation of blood, Dr. Cohn now becomes one of the four scholars of the University "especially chosen for work on the frontiers of knowledge."

CORRESPONDENCE

PUBLIC RELATIONS THAT MAY BACKFIRE

To the Editor: In the annual report for the year ending March 31, 1949, of The Institute of Living at Hartford, Connecticut, the psychiatrist-in-chief, Dr. Burlingham, discusses at some length what has been happening to psychiatry from publicity. A few quotations from this will give a very good idea of what Dr. Burlingham thinks of the effects of ill advised publicity on psychiatry. These quotations follow:

> When psychiatrists emerged from comparative obscurity a few decades ago, they had high hopes as to what could be accomplished . . . in the sphere of public relations and education. . . . Their objectives were to awaken the public to the long-neglected needs of the mentally ill. . . . Regardless of where the responsibility rests, the facts are that hordes of people are being given the impression that they need the services of psychiatrists; they are then being advised that the shortage of psychiatrists makes it quite impossible for them to get psychiatric help. They are being warned that one out of twenty-five per-

sons will wind up in a mental hospital; they are being presented with the terrifying picture of the horrible conditions in mental hospitals. . . . Something should be done to stop this onslaught of injudicious publicity, or at least to disidentify it from scientific psychiatry. . . . Publicity is a two-edged sword; publicity accidents are as common as publicity successes. . . . It is absolutely necessary for us to be conservative and modest in all of our public statements. Overemphasis and overclaiming are inevitably followed by loss of public confidence and respect, which often as not manifests itself in ridicule and satire. Symptoms are already evident that such a reaction to psychiatry is setting in. . . . We must ask ourselves if the efforts to arouse the public have gone out of balance.

As I read the constant inflow of pamphlets and letters and listen to the radio extolling the virtues of this or that medical project, I am impressed by their frequent overstatements, particularly the overenthusiastic claims, often being made. The idea for example is being given to the public that, if only enough money is given, the important problems of the cause and cure of many diseases surely will be solved, or that all that is needed to this end is the construction of new institute buildings or more hospital beds for research. A sort of dreamland of obliteration of suffering from disease seems in creation by these statements, but I wonder if there will not be an awakening from such dreamlands of publicity, if there will not come a future backfire from them as has seemingly come in the field of psychiatry. I fear that this may happen, and so I think it behooves organizing publicity campaigns for medical projects to be more cautious in their statements and promises than they now are.

HENRY A. CHRISTIAN, M.D.
20 Chapel Street
Brookline, Massachusetts

BOOKS RECEIVED

The receipt of the following books is acknowledged, and this listing must be regarded as a sufficient return for the courtesy of the sender. Books that appear to be of particular interest will be reviewed as space permits. Additional information in regard to all listed books will be gladly furnished on request.

Diseases of the Nose and Throat. A Textbook for Students and Practitioners. By Sir St. Clair Thompson, M.D., F.R.C.P. (London), F.R.C.S. (England), L.L.D. (Hon.) (Winnipeg); and V. E. Negus, M.S. (London), F.R.C.S. (England), surgeon for diseases of the throat, nose and ear, King's College Hospital. 8°, cloth, 1004 pp., with 44 plates, 13 in color, and 369 illustrations. Fifth edition. New York: Appleton-Century-Crofts, Incorporated, 1949. $16.00.

This standard textbook was first published in 1911. In this fifth edition the text has been thoroughly revised, and many chapters partially or completely rewritten. Major changes have been made in the subjects of malignant lesions of the nasopharynx, the pharynx and the larynx; simple neoplasms of the nasopharynx; treatment by sulfonamides, penicillin, radiotherapy and vitamins (combined to form a new chapter); allergy and nasal physiology; and laryngeal paralysis. Some rearrangement of the material has been made to provide a more logical text. This book, written by two British physicians, naturally reflects the British aspects of the subject. Likewise, the printing was done in Great Britain, and the sheets bound in the United States. The type, printing and illustrative work, including the color and radiographic plates, are excellent. The book should be in all medical libraries as a reference work and should prove valuable to all physicians interested in the subject.

A-B-C's of Sulfonamide and Antibiotic Therapy. By Perrin H. Long, M.D., F.R.C.P., professor of preventive medicine, Johns Hopkins University School of Medicine, and physician, Johns Hopkins Hospital. 12°, cloth, 231 pp. Philadelphia: W. B. Saunders Company, 1948. $3.50.

This small manual represents the experience of the author in the use of the sulfonamides and antibiotics over a period of twelve years. It is intended for the general practitioner and surgeon and should prove useful as a reference source in their daily practice. The volume is well published.

Plaster of Paris Technic. By Edwin O. Geckeler, M.D., professor of orthopedic surgery, and chief of the fracture service, Hahnemann Medical College and Hospital, Philadelphia. Second edition. 8°, cloth, 220 pp., 234 illustrations. Baltimore: Williams and Wilkins Company, 1948. $3.00.

This second edition of a standard monograph, first published in 1944, has been revised, and many illustrations have been added. The book is mainly illustrative, with a small amount of text. It is recommended to orthopedists and to all persons using plaster and to medical libraries as a reference source.

Die Funktionelle Organisation Des Vegetativen Nervensystems. By W. R. Hess, o.ö. Professor der Physiologie an der Universität Zürich. 8°, cloth, 226 pp., with 80 illustrations and 1 table. Basel: Benno Schwabe and Company, 1948. 18.50 fr.

This well written monograph constitutes a comprehensive survey of present-day knowledge of the functions of the vegetative nervous system. There are nine chapters, beginning with peripheral autonomy and ending with dynamic principles. A comprehensive bibliography of eleven pages concludes the text. There is a good index. The book is well published in every way. It is recommended for all medical libraries and should be available to all neurologists.

A Textbook of General Physiology. By Philip H. Mitchell, Ph.D., Robert P. Brown Professor of Biology, Brown University. Fourth edition. 8°, cloth, 927 pp., with 201 illustrations. New York: McGraw-Hill Book Company, Incorporated, 1948. $7.50.

This standard college textbook, first published in 1923, has been thoroughly revised in this fourth edition. Extensive changes have been made in the chapters on excitation and contraction, the structure of living matter, permeability of cells and nutritive requirements. The chapter on biologic oxidation has been entirely rewritten, and a chapter on intermediary metabolism has been added. Lists of references are added to the various chapters, and a good index concludes the text. The book is well published and is recommended to all medical libraries as a reference source.

Bailey's Text-Book of Histology. Revised by Philip E. Smith, Ph.D., professor of anatomy, College of Physicians and Surgeons, Columbia University; and Wilfred M. Copenhaver, Ph.D., associate professor of anatomy, College of Physicians and Surgeons, Columbia University. Twelfth edition. 8°, cloth, 781 pp., with 455 illustrations. Baltimore: Williams and Wilkins Company, 1948. $7.00.

This standard textbook, intended primarily for the use of first-year medical students, was first published in 1904 and since that time nineteen printings have been made; it was translated into Spanish in 1948. This twelfth edition has been revised throughout, and some extensive sections have been rewritten. Many new illustrations in color and halftone have been included. Lists of selected references have been appended to the various chapters. There is a good index. The publishing is well done, and the volume is recommended to medical libraries as a reference source.

Management of Common Gastro-Intestinal Diseases. By Thomas A. Johnson. 8°, cloth, 280 pp., with 16 illustrations and 4 charts. Philadelphia: J. B. Lippincott Company, 1948. $7.00.

This monograph in the *American Practitioners Series* is the joint work of twenty-two specialists in the field of gastroenterology. The authors, in short papers, epitomize the results of their experience in the treatment of a selected group of important gastrointestinal diseases. The book is written primarily for general practitioners and should prove of value to that class of physicians. The type and printing are excellent, but the use of a heavy filled shiny paper is uncalled for in a book of this type.

Edinburgh Post-Graduate Lectures in Medicine. Volume IV. 8°, cloth, 582 pp., with illustrations. London: Oliver and Boyd, 1948. 18/-net.

This fourth volume of a standard series brings together in one place forty-one articles by different authors on subjects in the fields of medicine, surgery, pathology and therapeutics, already published in the *Edinburgh Medical Journal* during 1945–1947. An index has been supplied, and the publishing, which is excellent in every way, is an outstanding example of good bookmaking. The series should be in all medical libraries.

Detailed Atlas of the Head and Neck. By Raymond C. Truax, M.S., Ph.D., associate professor of anatomy, College of Physicians and Surgeons, Columbia University; and Carl E. Kellner, artist, Department of Anatomy, College of Physicians and Surgeons, Columbia University. 4°, cloth, 162 pp., with 136 illustrations. New York: Oxford University Press, 1948. $15.00.

This beautiful atlas is the culmination of years of work by an anatomist and an artist. The color plates are excellent and compare favorably with foreign work of the same type. There is a comprehensive index to structures. The volume should be in all medical libraries and available to all surgeons who are interested in head surgery. The price is not expensive for this type of book.

Viral and Rickettsial Infections of Man. By Thomas Rivers, M.D., director of the hospital, The Rockefeller Institute for Medical Research. 8°, cloth, 587 pp., with 77 illustrations, 6 plates. Philadelphia: J. B. Lippincott Company, 1948. $5.00.

This treatise is the joint work of twenty-seven authors. The early chapters discuss the general and special aspects of the subject. The remaining chapters consider the various viral and rickettsial diseases. The material is well arranged. Bibliographies are attached to the various chapters. There are large author and subject indexes. The type and printing are excellent, but the use of a heavy filled paper is not justified when all the color plates are inserts. The book is outstanding and should be in all medical libraries and available to all physicians and others interested in the subject.

Technique of Treatment for the Cerebral Palsy Child. By Paula F. Egel, cerebral-palsy director, Children's Hospital, Buffalo, New York. 8°, cloth, 203 pp., with illustrations. St. Louis: C. V. Mosby Company, 1948. $3.50.

Miss Egel has had extensive experience in treating various types of cerebral palsy in children in institutions and in the home according to the methods of Dr. Phelps. The technics used are outlined in detail and should prove invaluable to persons called upon to treat these patients. Mr. Tanner, in an appendix, presents a plan for the organization of a cerebral-palsy department in a children's hospital.

The illustrations are excellent, and the outline drawings present in detail the exercises for conditioned motion. There is a good index. The monograph should prove invaluable to nurses and other persons having to deal with cases of palsy.

Liver Injury. Transactions of the Seventh Conference, January 15 and 16, 1948, New York, New York. Edited by F. W. Hoffbauer, M.D., 8°, paper, 95 pp., with illustrations. New York: Josiah Macy, Jr., Foundation, 1948. $1.50.

The subjects discussed at this conference included radioactive methionine, protein formation, portal hypertension, hepatic blood flow, plutonium, liver-cell regeneration, hepatic excretory functions and serum lipids in liver disease. The complete series of conferences is essential for medical libraries.

Studies from The Rockefeller Institute for Medical Research. Reprints, Volume 136. 8°, paper, 607 pp., with illustrations. New York: Rockefeller Institute for Medical Research, 1948. $2.00.

This volume presents in collected form the results of investigations carried on by research workers of the Rockefeller Institute or under grants and originally published in scattered periodicals and other publications. The period covered is approximately the last half of 1947 and the first half of 1948.

Radioactive Indicators. Their Application in Biochemistry, Animal Physiology, and Pathology. By George Hevesy. 8°, cloth, 556 pp., with illustrations. New York: Interscience Publishers Limited, 1948. $10.00.

This outstanding work in a new field presents a survey of work carried out with radioactive indicators in the subjects of animal physiology, pathology and biochemistry. The pertinent literature has been analyzed, and the references are appended to the text throughout the book. The material is well organized proceeding from the general to the special aspects of the subject. The type, paper and printing are excellent. The volume should be in all medical and allied libraries and should be available to all persons interested in the subject. It should have a long life as an authoritative reference work.

A Treatise on Contemporary Religious Jurisprudence. By I. H. Rubenstein, of the Illinois Bar. 8°, cloth, 120 pp. Chicago: Waldain Press, 1948. $2.50.

This monograph is devoted to a discussion of the civil, legal and criminal aspects of fortune telling, faith healing and pacifism. The part on faith healing appeared previously in the February 6, 1941, issue of *New England Journal of Medicine.* The text, which is profusely documented with citations from court records, is well written, and the material is well arranged in a typical legal style. An index would have made the volume more useful. Because of the documented section on faith healing the volume should be in the reference collections of all medical libraries.

The Mechanism of Abdominal Pain. By V. J. Kinsella, M.B., Ch.M. (Syd.), F.R.C.S. (Eng.). 8°, cloth, 230 pp., with 17 illustrations. Sydney: Australasian Medical Publishing Company, Limited, 1948. 32/6.

The author contends that the mechanisms of splanchnic pain do not differ essentially from those of somatic pain, and presents evidence to support his contention. He believes that true visceral pain and tenderness have an adequate anatomic basis and gives reasons for a belief in direct visceral tenderness. He stresses the fundamental inadequacy of experiments on pain in animals. The author postulates a neurohumoral basis for abdominal pain to replace the neuronal theory, and considers that this simple conception replaces that of indirect mechanisms and makes the clinical examination of the abdomen more simple and exact. A list of references and an index conclude the text. The book is well published and should be available to all persons interested in the subject.

Treatise on Surgical Infections. By Frank L. Meleney, M.D., associate professor of clinical surgery, College of Physicians and Surgeons, Columbia University, and associate visiting surgeon, Presbyterian Hospital, New York City. 8°, cloth, 713 pp. New York: Oxford University Press, 1948. $12.00. Oxford Medical Publication.

This book is the result of investigations carried on by the author and his associates during the past twenty years. It includes experience with the sulfonamides and the antibiotics. It is written especially for operating-room personnel, laboratory workers and surgeons. It emphasizes high standards of sterile technic in the operating room and the necessity of close co-operation of the laboratory and the surgical clinic. A number of chapters are devoted to the treatment of infections by surgery, chemotherapy, zinc peroxide, bacteriophage and penicillin. The material is well written. Lists of pertinent references are appended to the various chapters. A comprehensive index concludes the text. The book is well published. A good type is used, and the illustrations are excellent. The book is recommended for all medical libraries as a standard reference work and should be available to all surgeons and laboratory workers.

ANA Public Relations Workshop: A manual of practical public relations techniques prepared for the guidance of the national membership of the American Nurses' Association. obl. 8°, cloth, 32 pp., with 34 illustrations. New York: American Nurses' Association, Incorporated, 1948. $3.00.

This manual was prepared by Edward L. Bernays, counsel on public relations, for the purpose of making available to

nursing organizations the modern technics of public relations in all fields of publicity, including the press, radio and television, movies, direct mail and public meetings. The type, printing and paper are good, but the oblong size of the volume is awkward and bothersome. The same data could have been presented to advantage in a regular octavo form. The material in the book could be valuable to other than nursing organizations.

Your Baby. The Complete Baby Book for Mothers and Fathers. By Gladys Denny Shultz and Lee Forrest Hill, M.D. 8°, cloth, 278 pp., with illustrations. New York: Doubleday and Company, Incorporated, 1948. $3.50.

This de luxe volume is intended for parents, including fathers, and presents instructions and advice on how to care for babies from the time of their birth through their second year and for preschool children from two to six years of age. The preliminary chapters are devoted to various aspects of pregnancy. The concluding chapters discuss formulas and recipes and common ailments and accidents. The illustrations, photographic reproductions and line drawings are excellent and form an important part of the book. The volume should appeal to obstetricians and pediatricians, who might profitably refer it to their patients.

Polio and its Problems. By Roland H. Berg. With a foreword by Basil O'Connor, president of the National Foundation for Infantile Paralysis, Inc. 8°, cloth, 174 pp., with 24 illustrations. Philadelphia: J. B. Lippincott Company, 1948. $3.00.

Dr. Berg has written a popular history of epidemic poliomyelitis beginning with the widespread epidemic that swept over the northeastern section of the United States in 1916 down to the present time. He relates in simple language the progress that has been made in combating the disease during the past thirty-odd years. The text has been printed with a good, large type on a soft nonglare paper pleasing to the eye. There is a good index. The book is recommended for all public libraries and for all medical-history collections.

An Account of the Weather and Diseases of South Carolina. By Lionel Chalmers, M.D., of Charles-Town, South Carolina. In two volumes. Volume I. 8°, paper, portrait, 58 pp. London: 1776. Selections reprinted, Charleston: South Carolina Medical Association, 1948. Free.

The Committee on Historical Medicine of the South Carolina Medical Association, in commemoration of the centennial of the Association occurring in 1948, issued this facsimile reproduction of an important early American imprint specially pertinent to the medical history of South Carolina. The original publication is very scarce, and the opportunity to obtain this excellent reproduction should be taken advantage of by all medical libraries and medical historians.

Hospital Trends and Development, 1940-1946. Edited by Arthur C. Bachmeyer, M.D., director, University of Chicago Clinics and director, hospital administration course, University of Chicago and Gerhard Hartman, Ph.D., superintendent, State University of Iowa. 8°, cloth, 819 pp., with illustrations. New York: Commonwealth Fund, 1948. $5.50.

This composite volume covering the whole field of hospital administration and service comprises a large number of selected articles condensed from their original form in many periodicals published during the past few years. The makeup is excellent, but the lack of an index detracts from its reference value. The book is recommended for all medical, public-health and hospital libraries and to all hospital administrators.

The Alcoholic Woman. Case Studies in the Psychodynamics of Alcoholism. By Benjamin Karpman, M.D., chief psychotherapist, St. Elizabeths Hospital, Washington, D. C. 8°, cloth, 241 pp., 3 diagrams. Washington: Linacre Press, 1948. $3.75.

This monograph presents three extensive case histories of alcoholic women who had one factor in common: an unsatisfactory childhood environment characterized by parental stupidity or incompetence. In all 3 cases the acquaintance with alcohol was incidental and gradual, and gave no hint that it would become a possessive force in their lives. The patients were treated with the method of "objective psychotherapy." This monograph should prove of value to psychiatrists and psychoanalysts.

The Clinical Application of Psychological Tests. Diagnostic Summaries and Case Studies. By Roy Schafer, M.A., staff psychologist, Austen Riggs Foundation. Foreword by David Rapaport, Ph.D., Menninger Foundation. 8°, cloth, 346 pp. New York: International Universities Press, Incorporated, 1948. $6.75.

This monograph presents a method of applying a battery of six clinical psychologic intelligence and personality tests to a series of appropriate cases. Two of the chapters are devoted to case studies of psychopathic disorders. The book is a sequel to the two-volume treatise by Rapaport, Gill and Schafer, entitled *Diagnostic Psychological Testing* (Chicago, 1945). The volume should be in all psychiatric and psychologic collections.

A Method of Anatomy. Descriptive and Deductive. By J. C. Boileau Grant, M.C., M.B., Ch.B., F.R.C.S. (Edin.), professor of anatomy in the University of Toronto. Fourth edition. 4°, cloth, 852 pp., with 800 illustrations. Baltimore: Williams and Wilkins Company, 1948. $7.00.

This fourth edition of a standard textbook has been thoroughly revised, and many parts of the text have been rewritten. First published in 1937 there have been thirteen printings to date, which speaks well for its popularity. The illustrations have been revised by addition and deletion, the total being brought to 800 for this edition. The type, printing and diagrammatic drawings are excellent. The book is recommended for all medical libraries as a standard reference source and should prove valuable to all persons interested in anatomy.

BOOK REVIEW

The Ciba Collection of Medical Illustrations: A compilation of pathological and anatomical paintings. Prepared by Frank H. Netter, M.D. F°, cloth, 222 pp., with 191 full-color plates. Summit, New Jersey: Ciba Pharmaceutical Products, Incorporated, 1948. $6.50.

During the past eight years the Ciba company has published from time to time a series of educational illustrations, dealing with anatomy and pathology, which have been distributed to the medical profession as loose sheets in folders as published. The complete series is now brought together in one volume for the convenience of the many physicians who expressed a desire for such a publication. In reply to a letter issued by the company concerning the volume, 36,000 replies were received in the affirmative.

The material has been divided into four major sections as follows: lungs and chest; gastrointestinal tract; male reproductive organs and male and female mammary glands; and heart and aorta. The large color plates are accompanied on the same page by explanatory text. The artist, Dr. Netter, has long been engaged in medical illustrative work. His early illustrations were done in pure water color, but lately he has used casein paint, egg tempera and poster color in conjunction with the water color. Likewise, he has often employed colored pencils or pastels for shading over the painting or for working in fine detail.

In the illustrations in this book it has been the aim to stress clarity and simplification of detail. In the anatomic plates a schematic treatment has been adopted in the interest of detail. Likewise, color has been arbitrarily used to give emphasis and clarity. The arteries have been illustrated in bright red, and the veins in strong blue.

In the pathological illustrations, emphasis is placed on accurate color and realistic representation, and there is considerable simplification by the elimination of extraneous tissues, which obscures the essential pathologic condition.

The text is preceded by a table of contents listing each individual plate, and concluded with an index of subjects. The color work, both gross and minute, is excellent. The volume is an outstanding example of good bookmaking. It may be obtained only from the company.

(*Notices on page xvii*)